

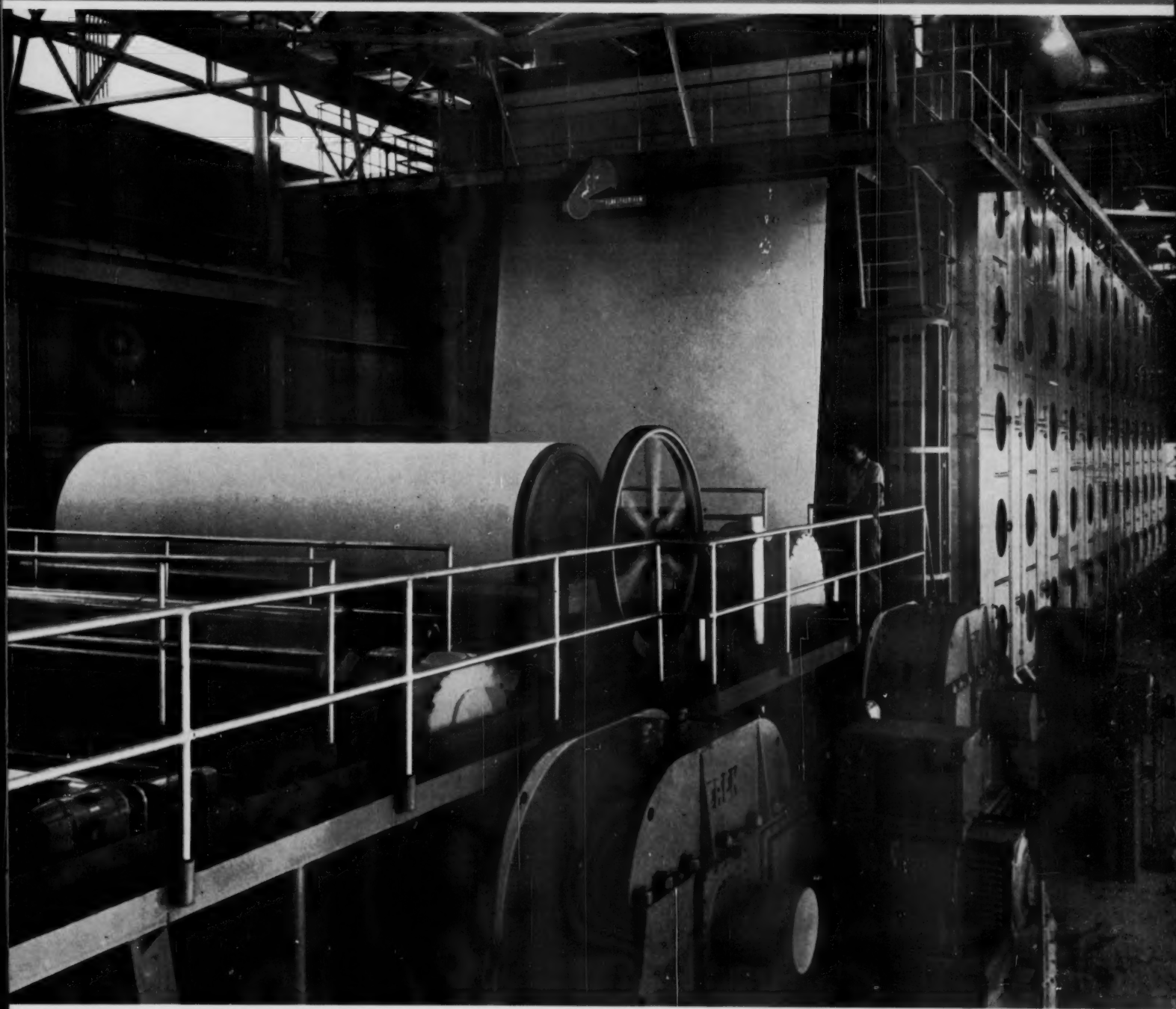
PULP & PAPER

NOVEMBER 1959

Bonding — New Knowledge
page 69

\$20,000,000 for Growth
page 86

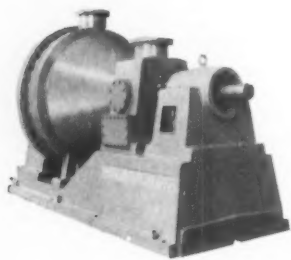
Plastics Coating Progress
page 84



BOWATERS UNVEILS CATAWBA MILL . . . see page 76
new type of dryer (above) . . . novel effluent disposal

NEW

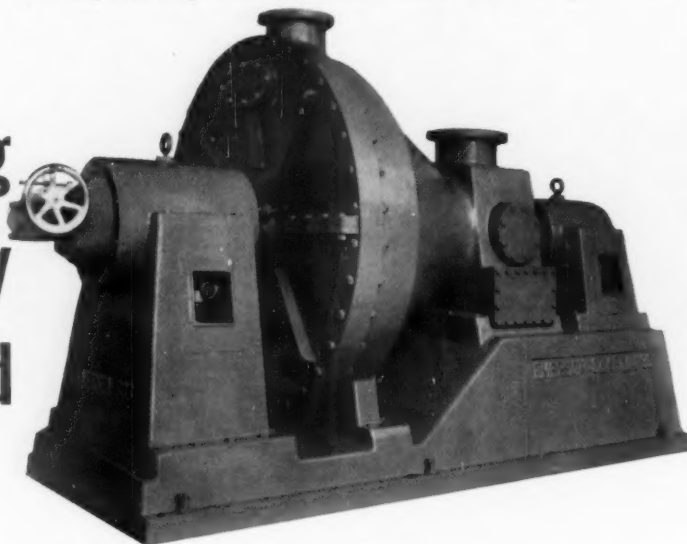
**refining
versatility
unmatched**



The NEW EMERSON CLAFLIN 303

introduces the very latest advances in refiner engineering and design. For example: the first conical refiner with oil mist atmosphere lubrication system, visual oil and pressure gauges and protective warning system; high gear ratio micro-feed plug adjustment; 100 p.s.i. operating pressure; split head design; all control and inspection areas on one side; and many other features. Each contributes to even greater refining efficiency, operating ease and lower cost maintenance.

Emerson Claflins serve the Papermaker for more purposes than any other refiner. This exceptional versatility is proven daily in mill after mill where Emerson Claflins are demonstrating their ability to develop the following wide range of fibers with a minimum of freeness drop.



- Fine Papers** — both soft and hard wood bleached pulp
- Food and Container Board** — both soft and hard wood bleached pulp
- Liner Board** — unbleached Kraft for both base and top sheet
- Bag, Wrap, Multi-Wall, Twisting and Gunning**
- Folding and Set-up Boxboards** — both filler and liner
- Corrugating Medium** — semi-chemical pulp and waste Kraft
- Wall Board and Roofing Paper**
- Hot Stock and High Yield** — following blow tank
- Screen Rejects** — fine and coarse groundwood and chemical pulp tailings

No matter what furnish you are running, or the specifications you have established for finished paper, it will pay you to investigate the versatility and tested refining efficiency of the Emerson Claflin 303 with its sectional hydrating shell and variety of other fillings. Only Emerson makes the Claflin. Write *The Emerson Manufacturing Co., Division of John W. Bolton & Sons Inc., Lawrence, Massachusetts.*

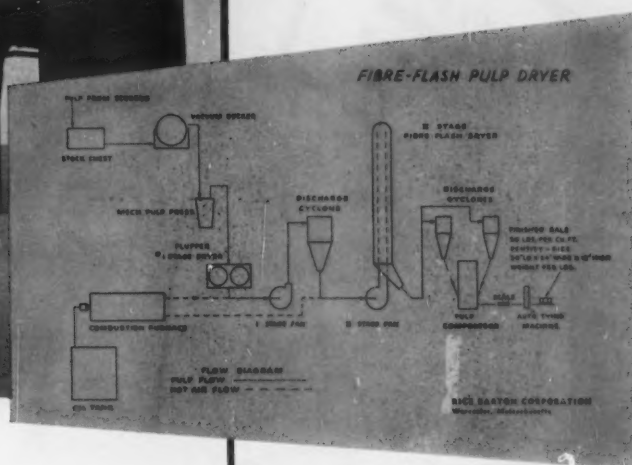
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CLAFLIN® **303**

A product of **BOLTON EMERSON**



The Rice Barton

FIBRE-FLASH DRYING SYSTEM



The "Fibre-Flash" drying process for use with all types of pulp consists of dewatering the pulp, fiberizing the concentrated pulp material thoroughly to insure uniform drying, evaporation of the fiber-bound water to the required degree of dryness and baling or bulking the material into convenient form for storage or shipment.

The drying medium, either combustion gases or hot air, carries the material to be dried through separate stages of the fiber-suspension-type flash dryer. The relatively high intake temperature flashes-off the surface water and the drying tower provides the necessary time element to permit a complete heat exchange to extract the remaining moisture in the fibers. Drying occurs at high evaporation velocity which maintains a low fiber temperature.

PHOTO COURTESY OF JOHN BREAKEY, LTD.

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Peak thermal efficiency.

Reduced labor costs.

Simplicity of equipment with moving parts at a minimum.

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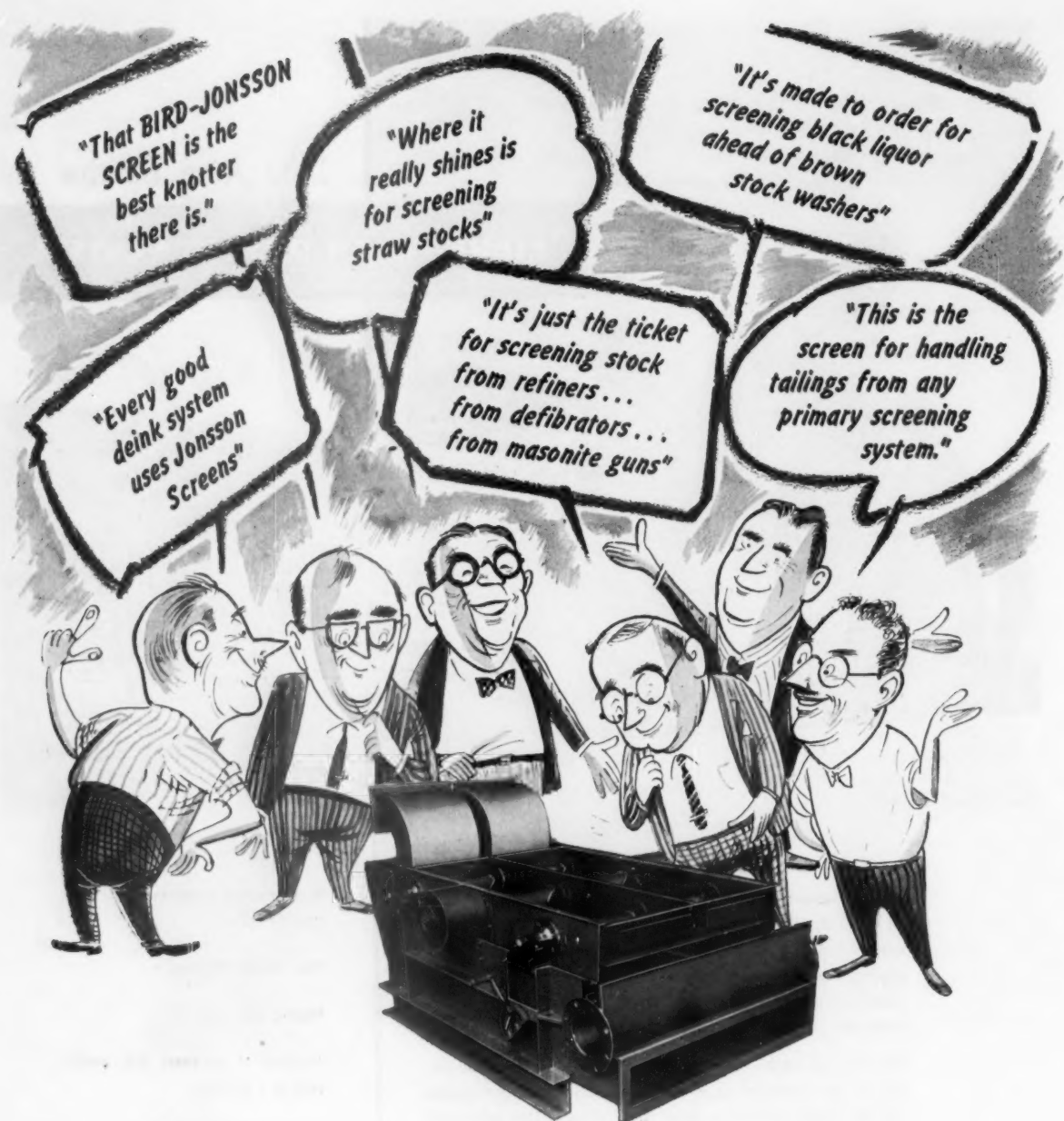
Ease of re-pulping.

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Paper Machinery Builders Since 1837





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BIRD MACHINE'S

50th YEAR

OF SERVICE TO INDUSTRY

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The Population "Explosions and Growth of Paper in U.S.A."; Paper is Money \$\$\$\$\$\$

Paving Way for Higher Machine Speeds	69
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International Symposium on Bonding and Fiber Attraction at Appleton, Wis., brought forth a new work from England revealing additional knowledge of machine break causes. A study from Germany presented factors that affect breaking loads on paper. From Appleton's Institute came new techniques calculated to advance papermaking skills.

Why Research Will Keep Growing	73
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President John Strange of the Institute of Paper Chemistry sees powerful influences bringing about greater scientific enterprise—population trends, collective security, need for effective use of natural resources, etc.

New Pulp Dryer Makes Bow in U.S.A.	76
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Bowaters' new Catawba, S.C., mill introduces in this country an air borne pulp dryer which highly pleases operators and promises to provide numerous benefits. It is calculated that pulp production of this new mill could reach 50% above design capacity.

Other innovations and special features of this new kraft pulp mill are described.

Bright Future for Plastics in Coating	84
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Polyethylene and its newest companion—polypropylene—took the spotlight at the recent 14th annual TAPPI Plastics-Paper Conference. New processes and new materials (some still in the planning stage) were the center of attraction for the more than 450 registrants.

Hammermill Invests \$20,000,000 to Grow	86
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Basing extensive growth program on its patented Neutrancel pulp process (which permits use of local hardwoods instead of imported softwoods), Hammermill has doubled its pulping capacity, expanded and improved almost every aspect of its fine paper operations.

Will Salvage Material Pay Way?	148
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Accurate prediction of removal costs become significant. Studies at Portland, Ore., show such prediction is definitely within the range of possibility.

CIRCULATION DEPT., 500 Howard St., San Francisco 5, Calif. C. C. Baake, Circ. Mgr. Send subscription orders and changes of address to PULP & PAPER, above address. Include both old and new addresses.

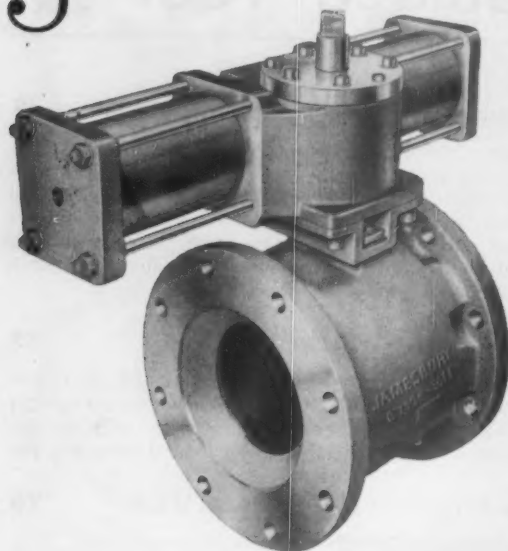
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jamesbury "Double-Seal" Ball Valves



For PULP and PAPER MILLS EFFICIENCY and ECONOMY TESTED, PROVEN

Jamesbury, leading designers and developers of the "Double-Seal" ball valve principle, now offer a series of valves for the pulp and paper industry. Exhaustive tests in mill runs have shown the effectiveness of these valves. An example is the Jamesbury Valve used in digester blow service. These valves are ideally designed to handle the after-cooking discharge.

Compare these unique features for *your* valve applications:

ZERO LEAKAGE — "Double-Seal" means seats and seals on *both sides* of the ball, assuring tightest possible closure on both sides of the valve.

HIGH FLOW CAPACITY — with minimum friction loss. Unique valve construction assures utilization of full pipeline capacity.

MINIMUM MAINTENANCE — rugged construction withstands pressure and shock. Needs no lubrication. Compact and lightweight. The self-wiping action of the Ball during rotation prevents residual build-up on sealing surfaces.

REMOTE CONTROLLED — operators available as integral, factory-tested unit, for pneumatic, hydraulic or electric operation.

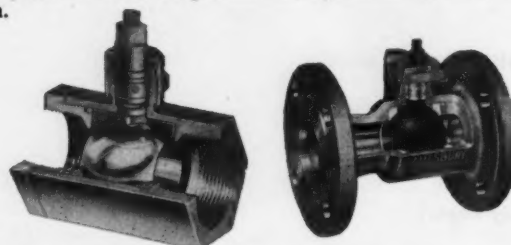
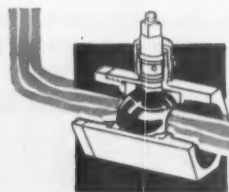
Investigate the Jamesbury Ball Valve concept for these pulp and paper mill applications:

- DIGESTER BLOW VALVES
- WHITE, BLACK AND GREEN LIQUOR LINES
- WATER LINES
- GAS OFF VALVES
- AIR LINES
- ACID LINES
- SAMPLING VALVES
- INSTRUMENT LINES
- BLEACH LIQUOR

Jamesbury "Double-Seal" Ball Valves will help you to:

- Prevent Loss of Cooking Liquor
- Reduce Blowing Time
- Increase Number of Cooks
- Assure Trouble Free Processing
- Increase Pulp Production
- Reduce Down Time

Ask for the new brochure "The Jamesbury Ball Valve In Pulp and Paper Mills." Distributors in Principal Cities.



WIDE RANGE OF MATERIALS — 303 and 316 Stainless Steel, Carbon Steel, Bronze, Aluminum and PVC (Polyvinyl chloride). TEFLON seats and seals — or, if desired, Neoprene or Buna-N. Flanged ALLOY 20, Ductile Iron and Monel valves are available on application.

SIZES — Jamesbury produces Screwed End valves in sizes from 1/4" to 3", Flanged valves from 1/2" to 8" as standard items. 150# and 300# series. 10" valves will be available during the last quarter of 1959. Please request information from Jamesbury Corp. on larger sizes.

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PULP & PAPER — November 1959

The Editor Reads His Mail



Address letters to The Editor, PULP & PAPER, 1791 Howard St., Chicago 26, Ill.

Potlatch Forests Denies Published Report (Not Ours) of Start in Building Mill

—Lewiston, Idaho

Editor: You are correct in assuming that the announcement relative to a new pulp and paperboard mill near Rohwer, Arkansas, is incorrect.

It is true that at some future date Potlatch Forests plans to construct such a mill somewhere in eastern Arkansas. However, its starting date will depend upon market conditions, and its construction, size, cost, production, or number of employees remains undetermined at this time.

We regret the misinformation which seems to have been taken out of context when some of our people were in Arkansas relative to this and other matters.

JACK CLIFFORD
 Director Public Relations
 Potlatch Forests, Inc.

Association Executive Finds Common Market Problems

Editor: Things at present are rather mixed up. The Common Market has confronted us with such a lot of new problems and unexpected situations that we are rushing about all the time from one meeting to another. The times are gone when being an official of an industrial association was a dignified position with calm routine. It is a horrible fight now for agreements, protections, preferences, etc.

Official of a European Pulp and Paper Association (name withheld)

Russia's Representatives Find Articles were "Objective"

—New Haven, Conn.

Editor: Please permit me to add my congratulations to the growing list for your recent series on your visit to the Russian Pulp and Paper industry. I found your report extremely interesting and objective. In the main, it jibes with our experiences, as reported by our officers.

Trips like yours, not only contribute to a better understanding of another sector of the industry, but serve to normalize relations between our

two peoples. This can only serve the cause of peace.

As Brokers for the Pulp and Paper Industry of the Soviet Union, we look forward to a continuation of your articles on that subject.

ALFRED L. MARDER
 Executive Vice-President
 Orbit Sales Co., Inc.

A Compliment

Fitchburg, Mass.

Editor: I wish to compliment the author and your magazine for the enlightening article by Mr. Edward McSweeney, vice president, Perkins Goodwin Co., entitled "Total Marketing's Big Surprise", which appeared in the October issue of PULP & PAPER.

D. D. UONG
 Senior Vice President
 Fitchburg Paper Co.

MEETING DATES CALENDAR

November 4-6
 TAPPI Alkaline Pulping Conference
 Robert Meyer Hotel, Jacksonville, Fla.

November 5
 Michigan Div. PIMA
 Hotel Harris, Kalamazoo, Mich.

November 9-10
 National Paperboard Association
 New York, N.Y.

November 10
 Lake States TAPPI
 Wisconsin Rapids, Wis.

November 15-18
 Society of American Foresters, 59th Annual Meeting
 Sheraton-Palace Hotel, San Francisco

November 16-18
 Packaging Institute Inc., 21st Annual National Packaging Forum
 Statler-Hilton Hotel, New York, N.Y.

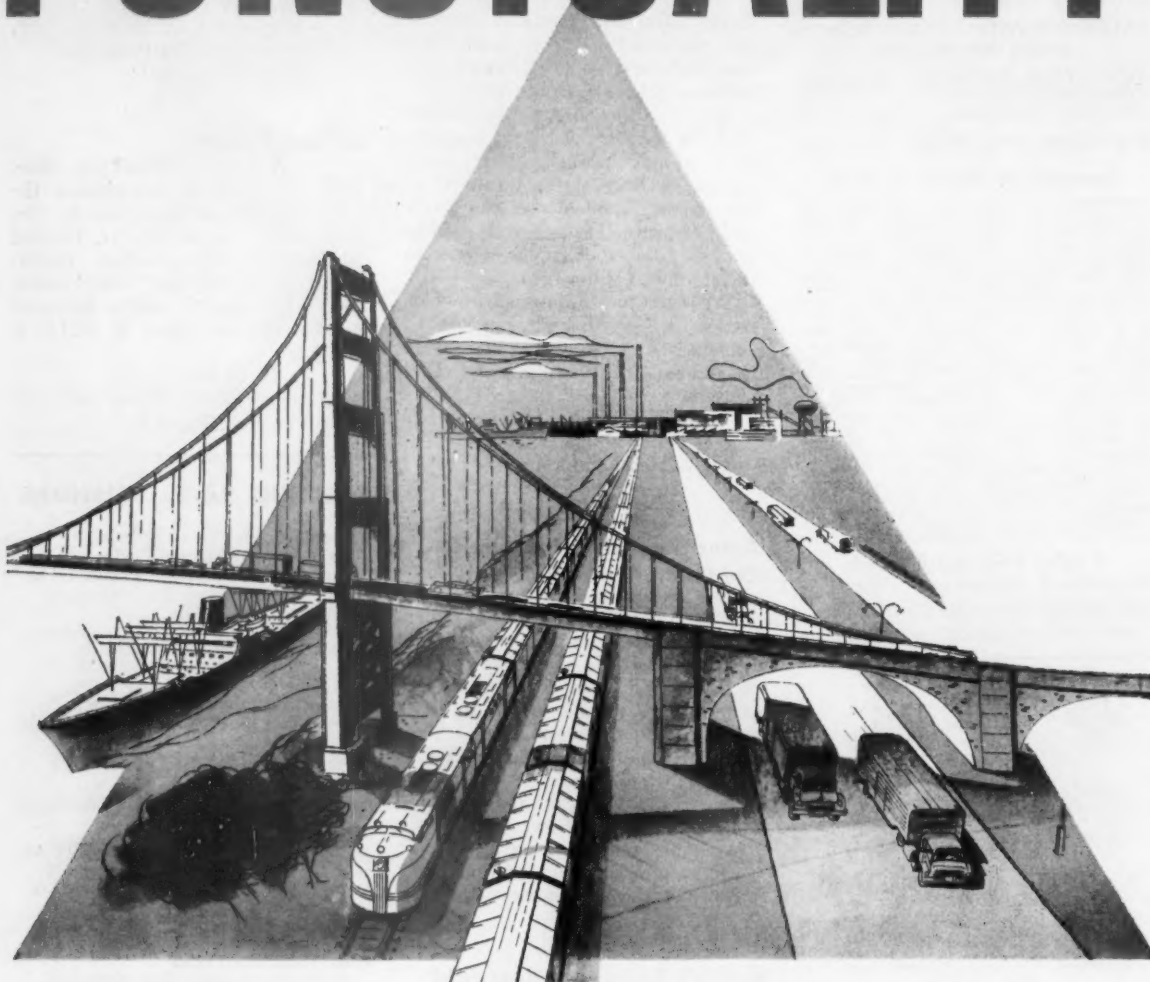
November 30-December 4
 27th Exposition of Chemical Industries
 Coliseum, New York, N.Y.

December 1-2
 North American Pulp, Paper and Paperboard Industrial Waste Conference
 Edgewater Beach Hotel, Chicago, Ill.

December 3-5
 Pacific Coast Division PIMA
 (Annual Fall Meeting)
 Olympic Hotel, Seattle, Wash.

January 26-29
 Canadian Pulp & Paper Assn.
 Montreal, Canada (Technical Sec. at Hotel Elizabeth)

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...when Gottesman enters the picture!
Pulp shipments that always leave on schedule:
only one small aspect of expert Gottesman
service, but *so* crucial to pulp buyers.
The assurance of punctuality,
regardless of pulp grade or quantity,
is *one* reason so many of our customers
have been with us for over 40 years!

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MONTHLY REPORT - WORLD NEWS

FOR SCANDINAVIA: AN ALL-TIME HIGH . . .

where both Swedish and Finnish exports of paper grade chemical market pulp appear headed for a record. Procedures have captured much of the increased 1959 world demand. In the first six months, combined shipments stood at 1,829,000 short tons, a 19% increase over the 1,373,000 tons of a year ago.

PLASTICS SUFFERS BLOW IN U.S.A. . . .

According to experts in the plastics industry, the recent scare resulting from babies smothering themselves in polyethylene (or other plastics) bags has threatened to create a situation where plastics would have to default this new-won market to paper. However, the plastics industry has retained the advertising agency Batten, Barton, Durstine & Osborne at a cost of \$600,000 to educate mothers on keeping plastics bags out of reach. . . . Making thicker gauge film was a suggested alternate that was not met with much enthusiasm. Perhaps this market isn't lost to paper.

ACTION IN SOUTHEAST ASIA . . . where a new firm has been established in India by Tata Locomotive & Engineering Co. for the manufacture of pulp and paper mill machinery. A Swedish firm proposes to invest up to 60% of the capital and supply technical know-how. . . . In other Indian developments: Balmer Lawrie & Co., in collaboration with a Swedish company, will build a plant in Assam for the daily production of 100 tons of bamboo paper pulp. . . . And the government has authorized establishment of a small paper mill in Madras.

FIRST STRAW WALLBOARD MACHINE . . . fabricated in the U.S.A. has been installed by Stramit Corp. in Havre, Montana. The first such unit was imported from Sweden, where the process for making wallboard from common wheat straw was discovered.

REPORTED FROM AUSTRIA . . . that the Soviet Union has expressed interest in Austrian paper and cellulose producing equipment.

MACHINERY EXPORTS UP . . .

in the United Kingdom, where foreign shipments of pulp, paper and board making equipment in the first five months were valued at £1,961,010 (\$5,490,828), as compared to £1,537,394 (\$4,304,703) in the same period last year.

LARGEST COMBINED PAPER MACHINE . . .

has been ordered from AB Karlstads Mekaniska Werkstad, Sweden, by Fiskeby Fabriks AB for its mill near Norrköping. The unit will have a trimmed width of 4,700 mm (185 in.) and a maximum speed of 400 mpm (1,312 fpm). The drying part will be equipped with the largest Yankee cylinder ever manufactured by KMW: 5.2 m (17 ft.) wide and 5 m (16 ft. 5 in.) in dia. Production: MG paper from both bleached or unbleached sulfate or sulfite. . . . KMW recently acquired all the shares of AB Finshyttans Bruk, Varmland, Sweden producer of water turbines and pulp and paper machinery.

EXPECTED NEW PACKAGE DEMANDS . . .

from the European Common Market and Free Trade areas has prompted Sweden and Finland to build board and linerboard capacity. Four or five new machines are reportedly in the planning stage.

"BOTH SIDES LOST" . . . That labor and management should confer more often during periods of industrial tranquility rather than wait until turmoil threatens was the view expressed recently by L. L. G. Bentley, vice pres. of Canadian Forest Products Ltd. Commenting on the recently-settled strike in the British Columbia forest industry, he said, "Both sides lost. . . ."

PAPER PLATE HAS "CHINA PROPERTIES" . . .

A throw-away plastic-coated paper plate has been patented by Akerlund & Rausing, Lund, Sweden packaging manufacture. The product will go into quantity production next year at company plants in West Germany, Denmark and Pakistan. The plate consists of three layers of paper. Polyethylene lamination is effected during pressing.

B.F. Goodrich



River of waste acid flows under river of water

B.F. Goodrich improvements in rubber brought extra savings

THE man in the diving suit is on his way to the bottom of the river to fasten another river in place. A paper mill across the way has to get rid of big quantities of hot waste acid. Just dump it in the river? That would pollute the water, kill fish.

Someone suggested taking the liquid waste across the river to a man-made lagoon. But how? Even the strongest steel pipe couldn't stand the hot acid or the buffeting of river currents.

After talking with a B.F. Goodrich

distributor, paper company engineers decided to try rubber hose made by B.F. Goodrich. The lining of this hose is made with a special rubber compound that stands hot acid. A spiral of steel wire buried in the hose keeps it from collapsing even under powerful suction. The thick, tough cover resists scuffing, gouging, and tears.

The first B.F. Goodrich hose line was hooked up, stretched across the water, then fastened to the river bottom by 2200-pound concrete forms. The hose

lasted 11 years without leaks, prevented pollution of the river even at times of low water. Because of this fine performance, the company replaced it with 800 feet of new B.F. Goodrich hose this summer.

Your B.F. Goodrich distributor has exact specifications for the B.F. Goodrich hose described here. And, as a factory-trained specialist in rubber products, he can answer your questions about the many rubber products B.F. Goodrich makes for industry. *B.F. Goodrich Industrial Products Co., Dept. M-704, Akron 18, Ohio.*

B.F. Goodrich industrial rubber products

MONTHLY REPORT – WORLD NEWS

NEW QUARTERLY SALES RECORD . . . established by West Virginia Pulp & Paper Co. Volume in the July-September period was \$58,956,000, as compared to \$51,813,000 on the third quarter of 1958. President David L. Luke attributed the increase to the strong demand for paper and paperboard, converted paper products, chemicals and wood products, "which enabled the mills to operate at more than 90% of capacity."

PACKAGING HAS GROWN INTO A \$15 BILLION . . . a year business in the U.S.A. It is still expanding. For the first six months of this year production of paper and board was approximately 13% ahead of 1958.

\$12,000,000 TWO-YEAR EXPANSION . . . has been reported by the Packaging div. of Olin Mathieson Chemical Corp. The project will broaden the firm's line of packaging products, increase pulp and paper production and improve customer service. The program will center at the West Monroe, La. headquarters, where a semi-chemical pulping system will be installed, as well as new wood-handling facilities and a bark-burning boiler.

UP 10% OVER 1958 . . . is the total capital expenditure planned this year by the pulp and paper industry. It is estimated that some \$636,000,000 will be invested in expansion and modernization. Preliminary figures for the immediate future, however, show a slightly diminishing trend: \$617,000,000 in 1960, \$611,000,000 in 1961 and \$587,000,000 in 1962.

FIVE-FOLD INCREASE . . . During the 1950s, some 30,000,000 lbs. of polyethylene were used each year in the U.S. coating industry. At the recent 14th annual TAPPI Plastics-Paper Conference in Chicago it was predicted that by 1965 this figure will stand at 150,000,000 lbs. (See Conference story in this issue.)

PRODUCTION AND MARKETING OF NON-WOVEN MATERIALS . . . is to be undertaken by a new corporation formed by Kimberly-Clark

Corp. and J. P. Stevens & Co. Inc. To be known as Kimberly-Stevens Corp., the new firm has expressed hope that the "joining of skills and experience of the paper and textile industries will result in creation and development of many new products and processes in the field of non-woven materials."

WISCONSIN LIKES THIS POLLUTION CONTROL METHOD . . . State authorities have given support to an industry-backed project for turbine reeration of strategic hydro plants to increase dissolved oxygen content in rivers. . . . An example of Wisconsin progress: Kimberly-Clark Corp. puts 70% less polluting material into the Fox River than it did 10 years ago.

CARDBOARD AND SEAWORMS . . . On the Atlantic Coast of the United States the lowly seaworm has come into its own as ocean sports fishermen discover its bait value. From Portland, Maine, to the Carolinas seaworms have taken on the aspect of big business. One operator shipped 6,400,000 worms last year alone. How? Packed in moist seaweed in cardboard boxes.

WORLD-WIDE POPULARITY MAY TAKE ITS TOLL . . . of the traditional Fundamental Research symposium at the Institute of Paper Chemistry, Appleton, Wis. At the recent September meeting, attendance was too much for the auditorium and overflowed into an outside hall. Future meetings may have to be in big hotels.

LUMBER-TO-PULP EXPANSION IN REVERSE . . . in St. Helens, Ore., where Crown Zellerbach Corp. expects to build a 200,000-bd. ft. sawmill. This is the firm's first lumber operation in the United States. Set for start-up in mid-1960, the plant will represent complete log utilization. Chips and log fuel will be hauled by truck to the firm's St. Helens mill, while sawdust will be shipped by rail to the Camas, Wash. mill, where it will be converted through the continuous digester process into kraft pulp.

The DRYER FELT
they are all talking about—

The **SCAPA**

**Synthetic Reinforced
Cotton Dryer Felt**

has been granted
U. S. Patent No. 2,882,933

Types 1166-S, 1164-S, 1464-S
2070-S and 2064-S are
Drying **more** paper **better**
every day

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MONTHLY REPORT — WORLD NEWS

NEW KRAFT PAPER-PAPERBOARD MACHINE . . . scheduled for installation at the Tacoma, Wash., mill of St. Regis Paper Co. According to J. M. Lamb, resident mgr., the overall expansion at the plant will cost \$30,000,000. The new machine will trim 236 in. and will have an initial daily capacity of 350 tons. A secondary headbox will make possible production of paperboards of "highest quality" printing surface.

ANOTHER MILL FOR OREGON . . . is planned by Menasha Woodware Corp. Construction is set "for the immediate future" on a \$5,000,000 plant in the Coos Bay area for the production of 100 daily tons of pulp and paper. According to the Menasha, Wis. company, completion is scheduled for 1961. The mill will supply paper to the firm's corrugated box plant in Anaheim, Cal., as well as to the market.

A CONTRIBUTION TO INTEGRATED DEVELOPMENTS . . . is how Boise Cascade Corp. of Boise, Idaho, terms its recent acquisition of Valsetz Lumber Co. and Herbert A. Templeton Lumber Corp. The move, according to Boise Cascade, will provide raw material for additional by-product utilization capacity.

ALL-TIME HIGH IN NEWSPRINT PRODUCTION . . . At the end of August cumulative output of U.S.A. mills stood at 1,301,439 short tons—a record for the period. . . . Canadian production amounted to 4,166,380 tons, 2.5% greater than in the first eight months of 1958.

KVP-SUTHERLAND MERGER . . . Directors of The KVP Co. and Sutherland Paper Co. have agreed in principle. Common shares in the new KVP Sutherland Paper Co. will be 1.2 for each KVP share and 1 to 1 for each of Sutherland. Dwight L. Stocker, KVP president, would be the president and chief executive officer.

PROVIDES MARKET FOR NEW ARIZONA MILL . . . Southwest Lumber Mills, one of America's

biggest lumber producers, has consolidated with three Los Angeles paper converters and wholesalers, Wilson Paper Co., Vernon Container Corp., and Pioneer Wrapping Co., all headed by A. J. Wilson. Southwest has plans for a pulp and paper mill in northern Arizona and new corrugating plant in Phoenix, where it owns Dolan-Burrus Box Co.

UP 25% . . . were indicated receipts of paper grade market pulp at U.S. paper and board mills during July, 216,694 short tons as compared to 174,365 a year ago. Seven-month receipts at 1,559,200 tons were 10.5% above the corresponding 1958 period. . . . At the same time it was reported that July consumption stood at 207,096 tons, an increase of 12.4% from the same month last year. Seven-month figures were 1,557,435 and 1,457,901 tons, respectively.

HOPSCOTCHING THE NORTH AMERICAN INDUSTRY . . . National Gypsum Co. will build a \$400,000 addition to its Town of Tonawanda, N. Y. research center; the action is expected to lead to the firm's entry into the manufacture of new plastic building materials. . . . **Diamond Gardner Corp.** and **United States Printing & Lithograph Co.** have joined to form a new company—**Diamond National Corp.** . . . Stockholders of **Flintkote Co.** and of **Calaveras Cement Co.** have approved the proposed merger of the two firms; Calaveras owns and operates a Portland cement plant at San Andreas, Cal. . . . **Finch, Pruyn & Co. Inc.** is building a two-story 48- by 66-ft. addition to its Glens Falls, N. Y. office building . . . **Federal Paper Board Co. Inc.** has purchased for cash **Sweeney Lithograph Co. Inc.**, Belleville, N. J. . . . **Melvin H. Baker**, chief executive of **National Gypsum Co.**, has predicted that in 10 years the construction industry will be nearly 50% larger than it is today and will account for about \$100 billion of the gross national product. . . . **Stone Container Corp.**, Chicago, has purchased **Delmar Paper Box Co.**, Cincinnati.



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Utilization of Hemicelluloses from Spent NaOH

Kozmál, F., Svitek J., and Pikler, A. *Papír a celuloza* 13, no. 8:169-71 (Aug., 1958). [In Slovakian; Russian, German, and English summaries] Abstr. Bull. I.P.C. 29:1115-6.

After recovery of sodium hydroxide by dialysis, the spent dissolving pulp refining liquor contains up to 35% pentosans, which can be utilized for the manufacture of furfural. Experiments were carried out to determine the condition under which the maximum furfural yield could be obtained. The hemicellulose material, containing 32-1% xylose, 4.5% mannose, 16.1% glucose, 27.3% solids, and 10.2% ash, was heated in autoclaves for 0.5-2 hr. at 150-200° C. with 0.1-1% sulfuric acid at a solids: liquor ratio varying from 1.5 to 1:15. The rectified furfural obtained was 99.7% pure, had a specific gravity of 1.1582, a refractive index (at 20°) of 1.5200 and contained 0.36% organic acids (calculated as acetic acid.) Maximum furfural yield (91.6% on the basis of pentosan weight) was obtained by heating for 1 hr. at 190° with 1% sulfuric acid at a solids: liquor ratio of 1.15.

Kraft Bleaching—Italy

COLOMBO, P., CORBETTA, D., PIROTTA, A., RUFFINI, G., and SARTORI, A. *Assoc. tech. ind. papetière*, Bull. no. 1: 4-24 + 1 insert (1959). [In French] Abstr. Bull. I.P.C. 29:1753.

In a study of the effect of bleaching stages and agents on kraft pulp, carried out on two samples having a Roe number of 4.2 and 5.7, the following results were obtained: At equal chlorine consumption, one-stage chlorination followed by alkaline washing results in lesser degradation of cellulose (higher viscosity) as compared with two-stage chlorination (with alkaline washing between the two stages). A more complete removal of pentosans and substances soluble in 17.5% alkali is achieved at a pulp consistency of 15%, as compared with 8-10%, the loss of mechanical strength being equal. The addition of hydrogen peroxide to the alkaline washing solution increases the brightness without affecting the mechanical properties of the pulp. To avoid undue reduction in viscosity and losses in mechanical strength, the quantity of hypochlorite

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must be kept at a minimum. The best results are obtained in a one-stage treatment with a quantity of hypochlorite calculated so as to be consumed within 90-120 min. Hypochlorite treatment of pulps having a high degree of brightness (about 80 photovolt units) causes considerable degradation of cellulose. Pulps having the highest mechanical strength properties (losses in breaking length and bursting and tearing strengths not exceeding 10%) are obtained by three-stage bleaching (chlorination-alkaline washing-hypochlorite) to a brightness of 65-70 photovolt units, followed by alkaline washing and a final bleaching stage with hydrogen peroxide at pH 10.5, sodium perborate, or sodium chlorite at pH 3. Final bleaching with sodium chlorite or, better, with a combination of sodium chlorite and peroxide, can be recommended because of the relatively high brightness obtained (about 84 photovolt units) and the resistance of bleached pulps to color reversion under the influence of light and heat. The semi-bleached pulps from the three-stage bleaching are characterized by a low lignin content and high mechanical strength.

Beating of Pulp Mixtures

Jensen, W., Nordman, L., and Niemi, J. *Assoc. tech. ind. papetière*, Bull. no. 6: 177-84 (1958). [In French] Abstr. Bull. I.P.C. 29:1112.

Samples of birchwood and spruce-wood sulfite pulps were dyed with Procion Brilliant Red 5 BS and Procion Brilliant Blue RS, respectively. Dyed and nondyed pulps were beaten in a Jokro mill, separately and in 1:1 mixtures. Dyeing increased the rate of beating, lowered somewhat the breaking length and the tear strength and increased the burst strength of beaten pulps. The effect of both dyes on the same pulp is identical. Thus, dyed pulps cannot be used to determine the absolute values of the beating rate or mechanical properties of mixed pulps but are perfectly suitable for comparative studies. No conclusive results

were obtained in a study of fractionated dyed pulps, beaten separately and in a 1:1 mixture. Microscopic determinations of the fiber-length distribution in unbeaten pulps and in pulps beaten separately and in mixtures for 20 and 60 min. showed that, in mixtures, birchwood contains a larger fraction of long fibers (1.3 mm.), whereas the long-fiber fraction of sprucewood is reduced slightly, and its 0.3-mm. fraction is increased.

Coating Materials Properties

LIND, V. W. *Wochbl. Papierfabrik*, 87, no. 7: 245-7 (April 15, 1959). [In German] Abstr. Bull. I.P.C. 29:1771.

After discussing the four fundamental types of flow curves (ideal or Newtonian, plastic, dilatant, and pseudoplastic), as well as the phenomenon of thixotropy, the author examines their significance for the paper-coating process in a Massey roller coater and in a horizontal or vertical size press). Thixotropic behavior seems to be best for a pigment coating for purposes of avoiding visible markings. Factors affecting the flow behavior of pigment coatings are discussed, including the sorptive properties of the paper substrate and the concentration, dryness, viscosity and particle size of pigment suspensions.

Breaks During Glazing

Wochbl. Papierfabrik, 87, no. 9: 363-5 (May 15, 1959). [In German] Abstr. Bull. I.P.C. 29:1759.

Excessive web breaks with resultant high waste (broke), as well as low gloss, were observed when thin pergamin (imitation parchment) papers of 40 g./sq. m. and lower basis weight were calendered in a wide supercalender having 16 cylinder rolls, instead of a narrower calender with 12 glazing cylinders. For papers of higher basis weight, the wider calender proved to be advantageous. The difficulties were remedied by using asbestos-paper rolls in place of rag-paper rolls, by a more careful control of paper moisture and of steel-roll polish and temperature 120-160°C.), by installing special guide rolls to reduce inter-roll friction and excessive paper tensions, and by driving the calender through a roll higher than the bottom roll. Directions for the satisfactory operation of supercalenders are given.

Here, a company has converted 368 bearings on 3 paper machines to MICRO-FOG. Results include reduction of bearing temperatures as much as 50°F and a 66% reduction in oil consumption.

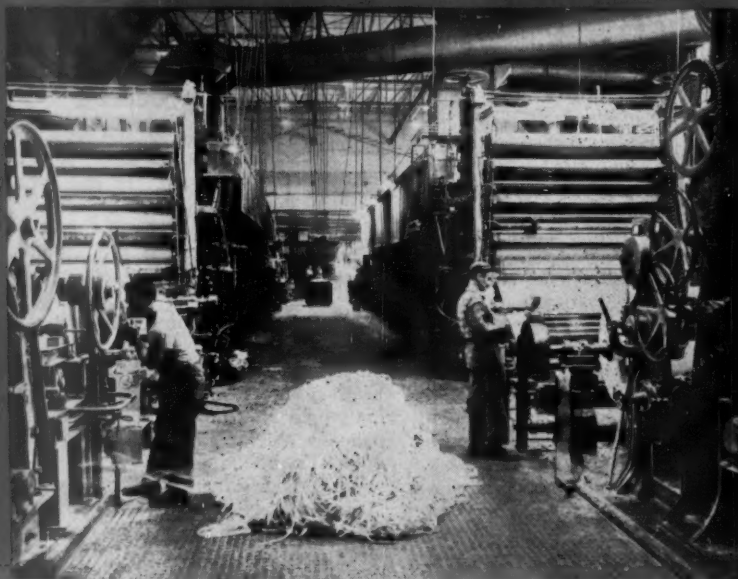


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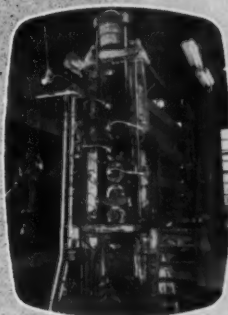
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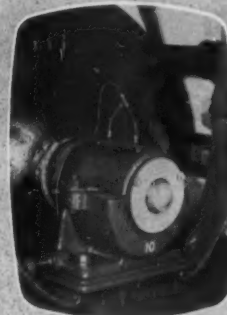
Calendar stack—18 bearings lubricated by Norgren MICRO-FOG.



Press rolls on wet and of paper machine, showing MICRO-FOG lines to bearings.



A bearing on a dryer roll, with MICRO-FOG conveyed from a manifold line.



A plain bearing lubricated by two MICRO-FOG distribution lines.

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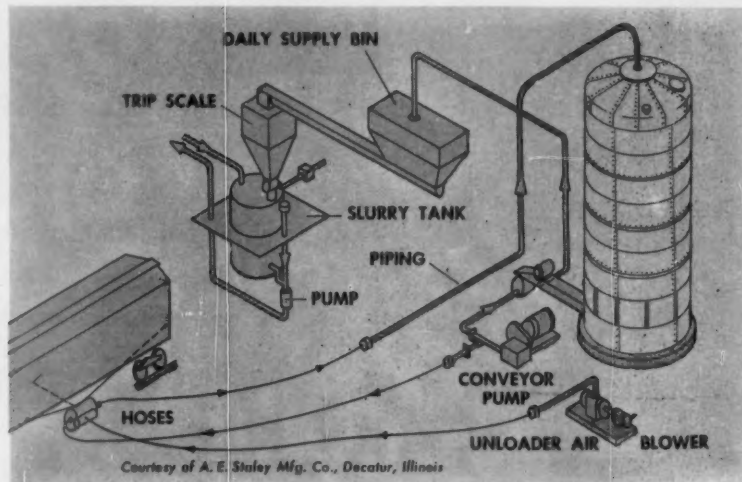
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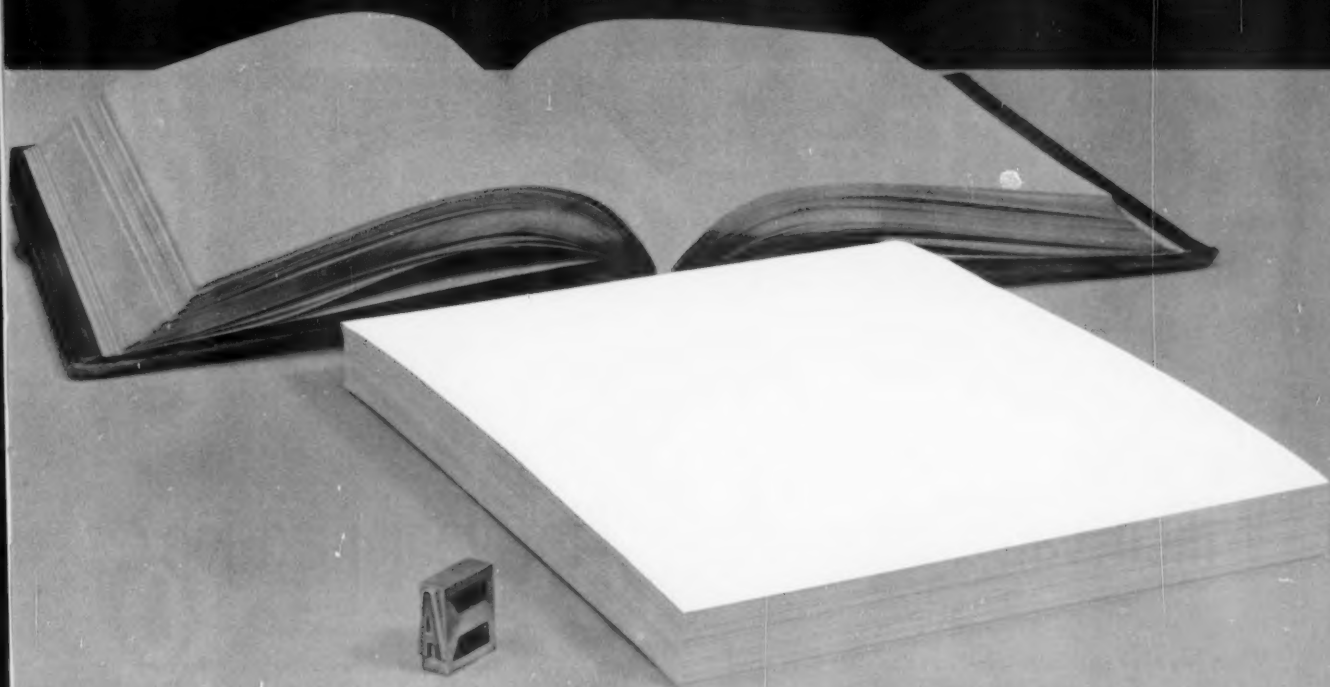
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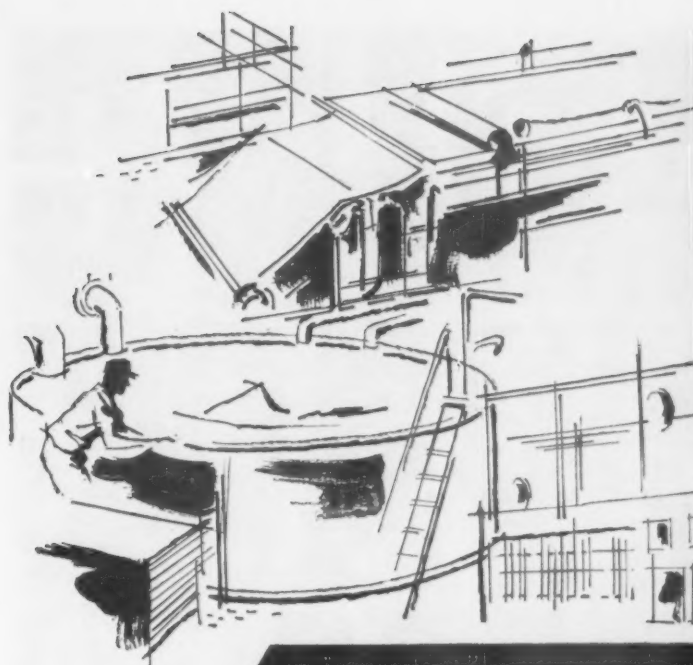
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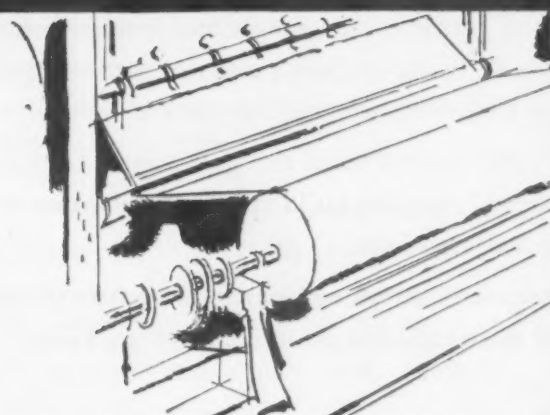


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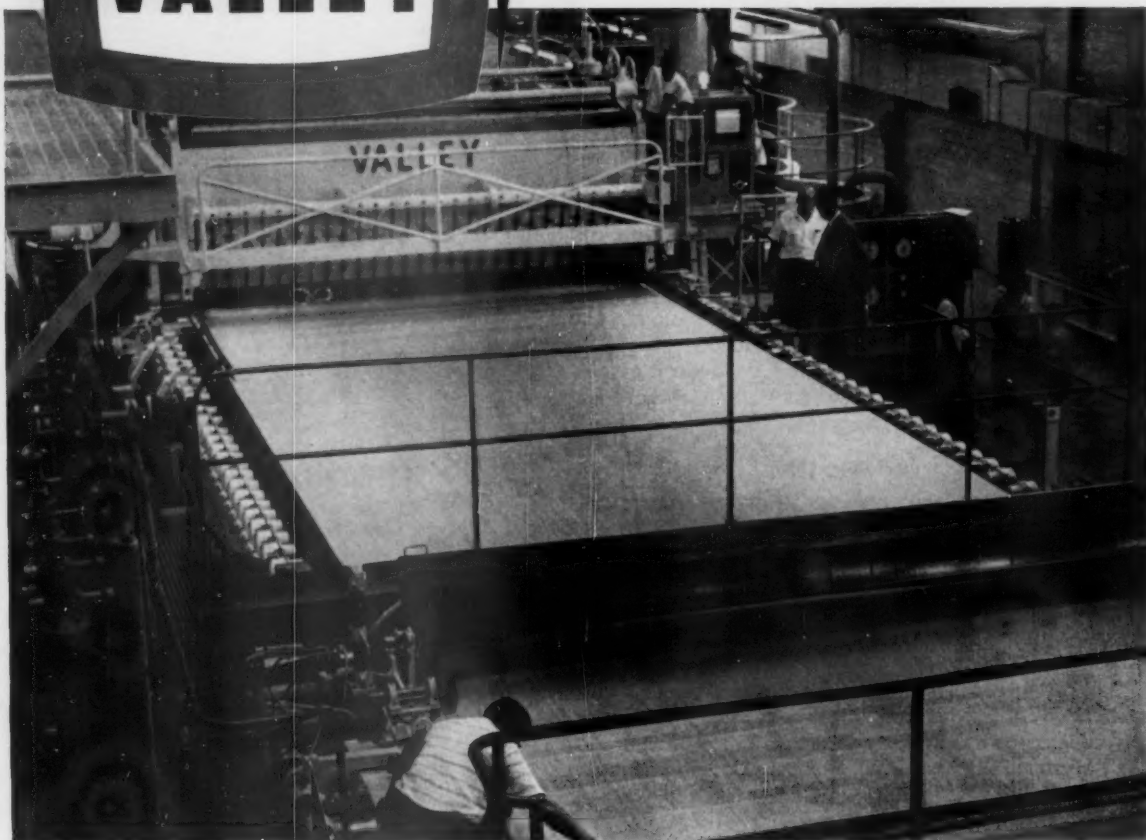


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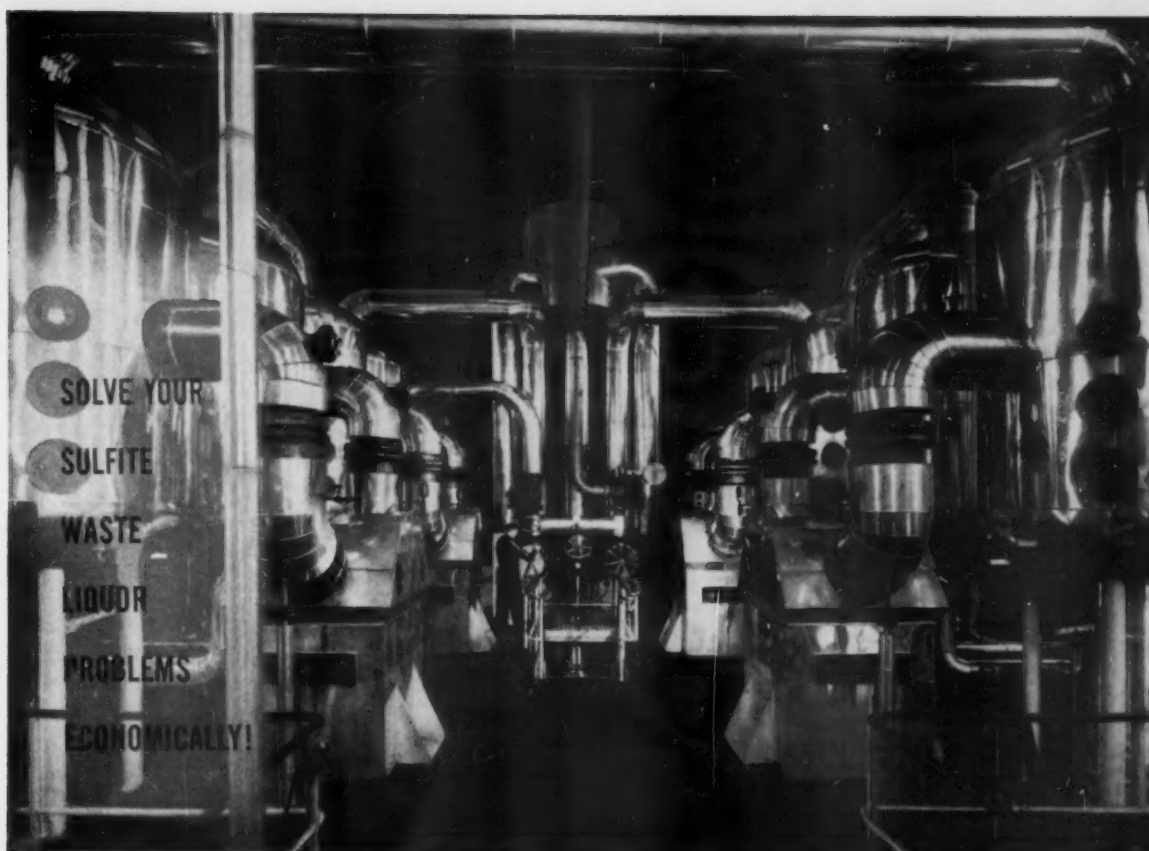
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No. 91 — Peroxide Bleaching of Chemo-Mechanical Hardwood Pulps.

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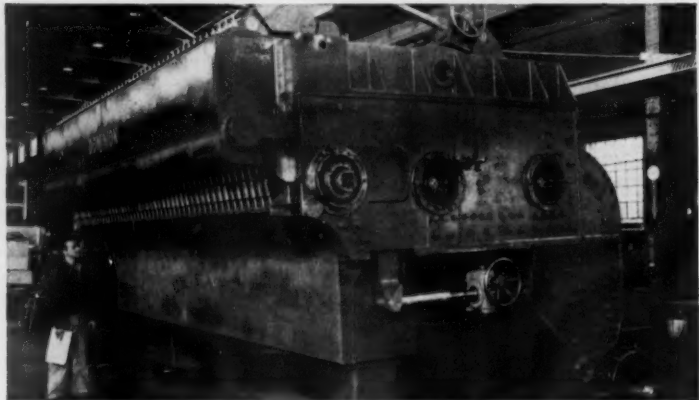
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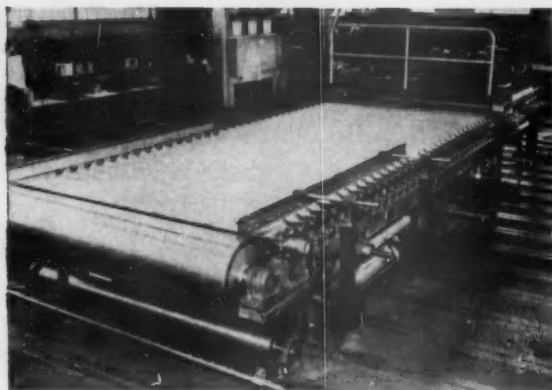
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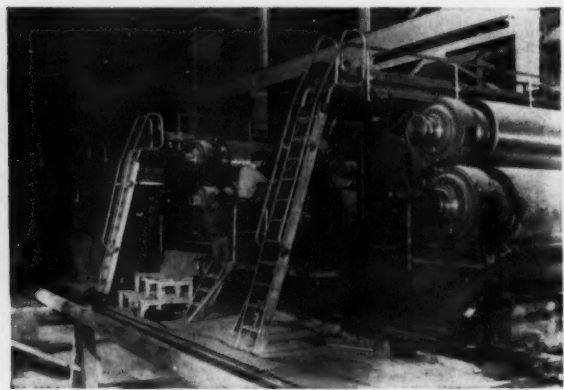
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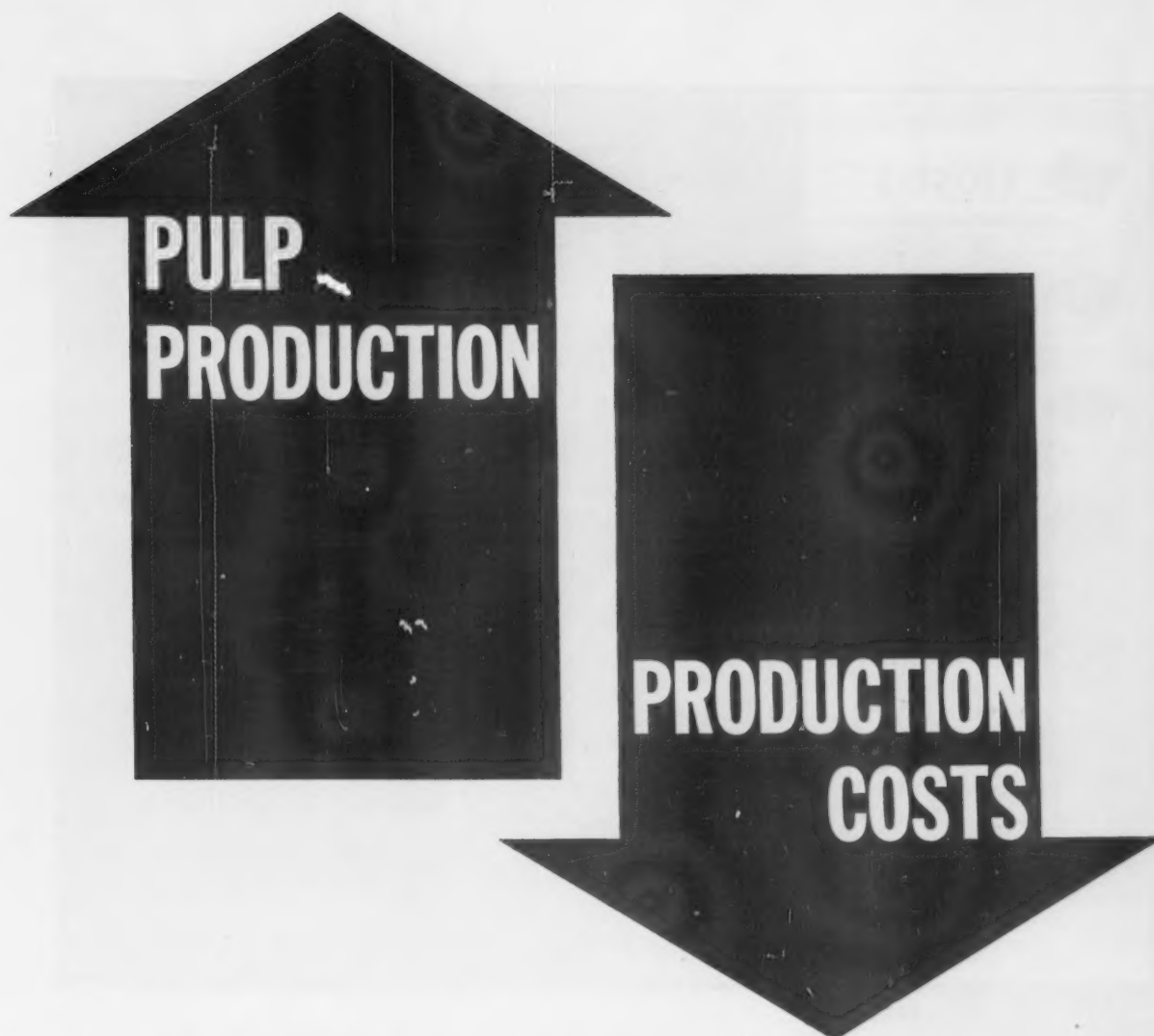
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with nominal capital investment

key: AMMONIUM BISULFITE PULPING

More mills than ever are looking at Ammonium Bisulfite Pulping as an economical way to increase pulp output. Mills that have already converted to ABP are now realizing the substantial cost savings this process gives them.

With little increase in capital investment, ABP shortens cook-

ing time, thus reducing the cost of steam per ton of pulp while it increases digester output 20% or more. Yields from the wood itself go up too, because there are fewer rejects during screening. A wider choice of pulpwoods—soft or hard—is a bonus advantage.

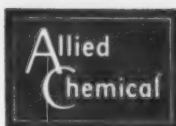
The ammonia process eliminates

entirely the maintenance problems caused by "liming up." Easier pollution control further reduces costs.

Another fact you should know: Allied Chemical pioneered ABP, and Allied's technical specialists can help you with detailed information as you weigh its merits for your mill. Call them in for an exploratory talk.

For specifications and local offices, see our insert in Chemical Materials Catalog, pages 435-442 and in Chemical Week Buyers Guide, pages 35-42, or write our New York office.

BASIC TO
AMERICA'S
PROGRESS



NITROGEN DIVISION
Dept. AA13-25-3, 40 Rector Street, New York 6, N. Y.



KEOGELS

*Pregelatinized—ready to use
—beater starches.*



KEOTACS

*Cationic—effective—
economical wet end additives.*



KEOZYMES

*Enzyme converting starches for
sizing and coating adhesives.*



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complete line for sizing and
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*New line of corn starch
derivatives for sizing and
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*Economical—controlled
viscosity thinboiling starches
for special sizing
applications.*

*There's More to Buying Starch
than Getting a Good Product...*

TO IMPROVE QUALITY SPECIFY...



STARCHES...for every Paper Mill Operation!



TO LOWER COSTS...

call on Hubinger Technical Service.
You can depend upon our labora-
tory facilities and trained field
personnel to supply the best and
most economical solution to your
starch and adhesive problems.

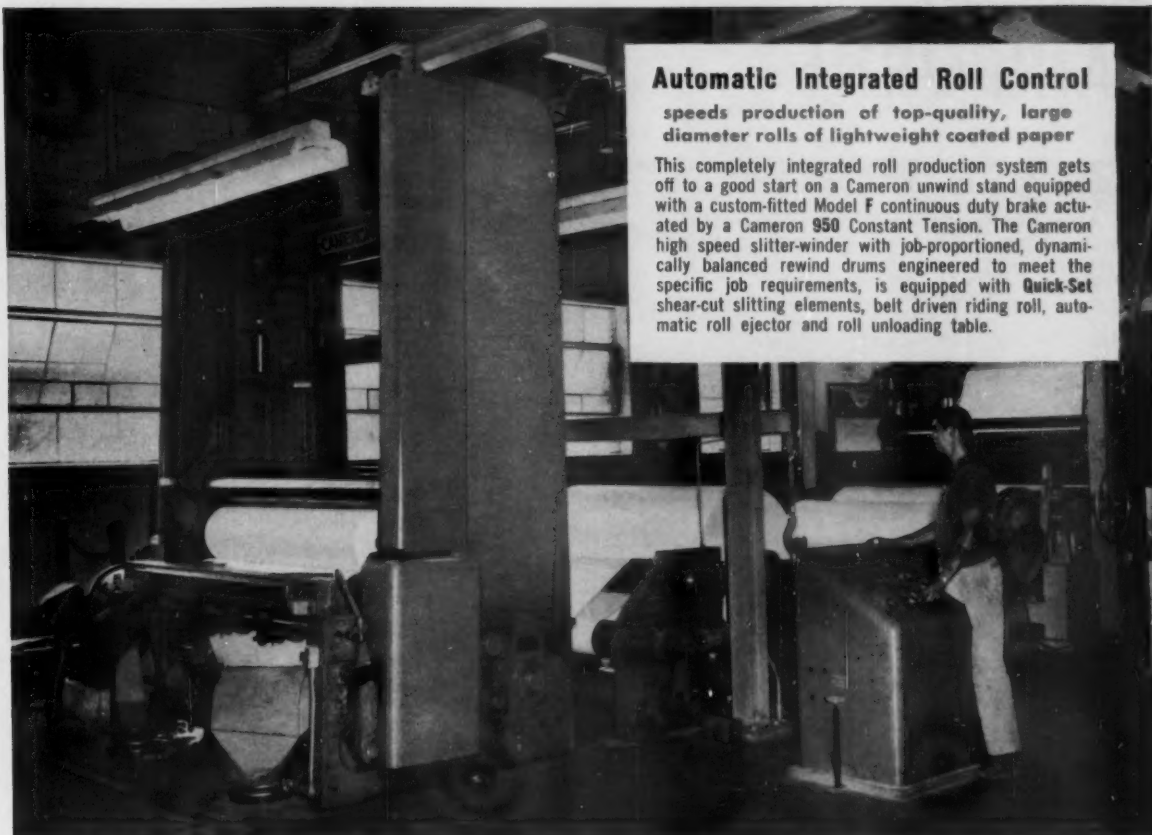
There are OK BRAND products—
made especially for every paper mill operation that
calls for starches and adhesives. Best of all,
there is no extra tariff on any of these top-quality
Hubinger items. If your mill needs special
starch products to meet improved quality or
strength specifications, let our nearest paper-starch
technical service representative study your needs.
He is prepared to quickly offer valuable aid.
Just phone or wire us.

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Automatic Integrated Roll Control

speeds production of top-quality, large diameter rolls of lightweight coated paper

This completely integrated roll production system gets off to a good start on a Cameron unwind stand equipped with a custom-fitted Model F continuous duty brake actuated by a Cameron 950 Constant Tension. The Cameron high speed slitter-winder with job-proportioned, dynamically balanced rewind drums engineered to meet the specific job requirements, is equipped with Quick-Set shear-cut slitting elements, belt driven riding roll, automatic roll ejector and roll unloading table.

Cameron Automatic Roll Control, perfectly integrated from unwind to finished rolls, assures top-quality slitting and rewinding at

5000 FPM ON LIGHTWEIGHT COATED PAPER

... staying well ahead of the new high speed coating operation at Crocker Burbank Company's Number 3 Mill, Fitchburg, Massachusetts.

New high speeds are multiplying the risks in fast new printing and converting operations. Printers and converters can no longer afford the cost of poor quality rolls, web breaks, damaged materials, or rolls that peter out too quickly on long runs. There is an increasing need for perfect, clean-cut, large diameter rolls of uniform density. That is why leading finishing room superintendents agree on this point — the modern, high speed, roll production system must be custom-engineered by specialists to provide automatic, integrated roll control from unwind to finished rolls.



Write now for literature on Cameron high speed slitter-winders, unrolls and web controls for paper mills and finishing rooms.

Cameron Machine Company, Franklin Road, Dover, N. J.

Canada: Cameron Machine Co. of Canada, Ltd., 15 Hatt St., Dundas, Ontario

France: Batignolles-Chatillon, 5 Rue De Montessuy, Paris (7e) France

CAMERON
a team of specialists

AA-370

53 years devoted exclusively to the design and manufacture of slitting, roll winding, unwind and web control equipment.

PULP & PAPER — November 1959

29

another **SF** first...

AIRBORNE pulp drying **FLAKT® DRYER** in new



SF FLAKT DRYER TYPE L with airborne web; in operation at BOWATERS CAROLINA CORPORATION, Catawba, South Carolina. With a capacity of 450 TPD of pulp, the dryer is remarkably small — only 104' long.

SF FLAKT DRYER, type L

features an advanced air distribution system. Floating on hot air jets, the pulp sheet rides like a MAGIC CARPET through the dryer. There are no mechanical conveyors.

- **LESS MAINTENANCE AND OPERATING COST.** The absence of mechanical conveyors eliminates costly downtime for repairs and saves man-hours spent on upkeep.
- **SMALL SIZE.** Higher drying rate drastically cuts dryer size thus reducing building costs.
- **HIGH OUTPUT.** SF Flakt Dryer type L permits high operating speeds and can be built for any desired capacity.
- **AUTOMATIC THREADING.** The unit can be equipped with fully automatic threading.

For further information please contact:



AMERICAN SF PRODUCTS, INC.

420 Lexington Avenue, New York 17, N. Y. Tel. ORegon 9-6980

In Canada: SF Products Canada, Ltd., 940 Cote de Liesse Road, Montreal 16, P. Q.

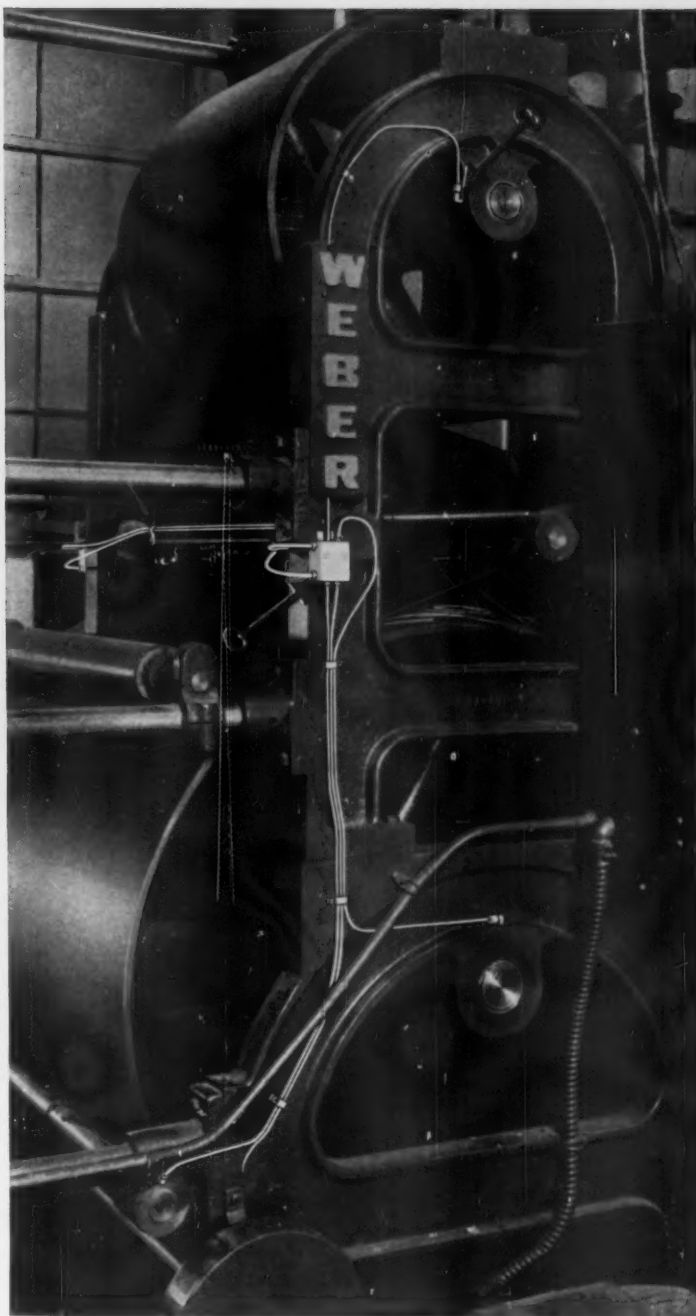
● Registered Trademark

Farval eliminates downtime, saves lubricant on Weber high- speed bag machine

THIS Weber Bag Making Machine at Bemis Bro. Bag Company's Vancouver, Washington, plant has been in continuous trouble-free operation for over 3 years. Its modern Farval system—continuously delivering measured amounts of lubrication at regular intervals—has eliminated all downtime due to either faulty lubrication or bearing loss.

Bemis Bro. Bag report their Farval system saves over 20% in lubricant required as well as contributing to the over-all cleanliness of the general work area. This is most important in the paper bag industry, because a dirty, stained product means rejects—lower profits.

Investigate how a Farval system can solve your lubrication problems. Write today for Revised Bulletin 26-S, The Farval Corporation, 3268 East 80th St., Cleveland 4, Ohio.



KEYS TO ADEQUATE LUBRICATION

Wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

FARVAL—Studies in Centralized Lubrication No. 219

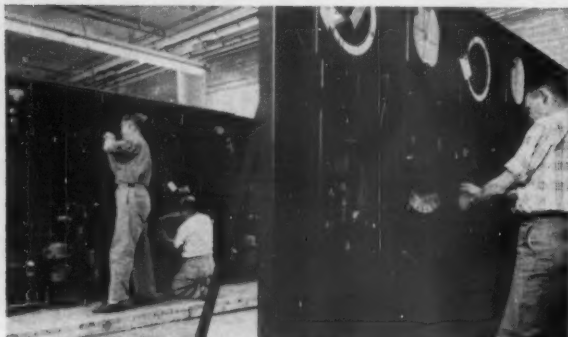


Honeywell gives you the most for your instrumentation dollar . . .

BECAUSE YOUR COMPLETE
MILL INSTRUMENTATION CAN BE INSTALLED
BY THOSE WHO KNOW IT BEST



1. No "Will it work?" Worries. We custom design control systems for a single process or for your entire mill. This means instrumentation that is matched to your processes and will do the job you want it to do.



2. No Pre-Installation Problems. We carefully co-ordinate materials and labor; ship panels prewired and piped, ready to install. No need to recruit, relocate, or reassign personnel.



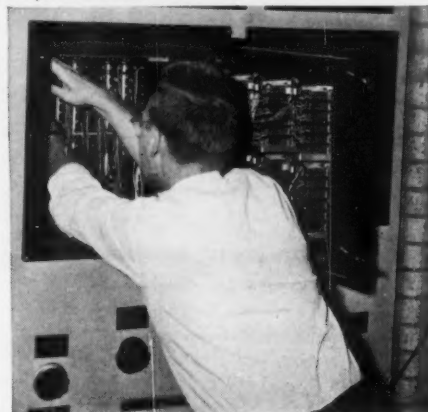
3. No Installation Headaches. We will contract to completely install instrumentation. Honeywell technicians will perform the prestart-up check out and deliver an operating control system to you. You get installation plus peak performance from your control system in the least possible time.

Honeywell offers you far more than just instruments. You can get all or any part of these time and money-savers. Add to these services our many years of engineering and application know-how. You'll see why Honeywell is your best buy in pulp and paper instrumentation, whether you deal directly with us or through your consultant or contractor.

Honeywell

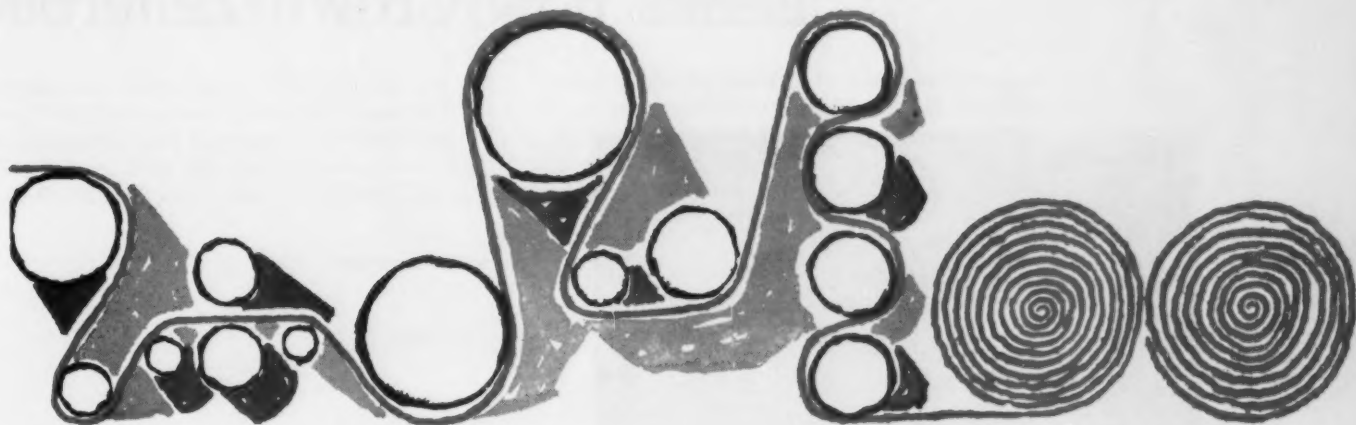


First in Control

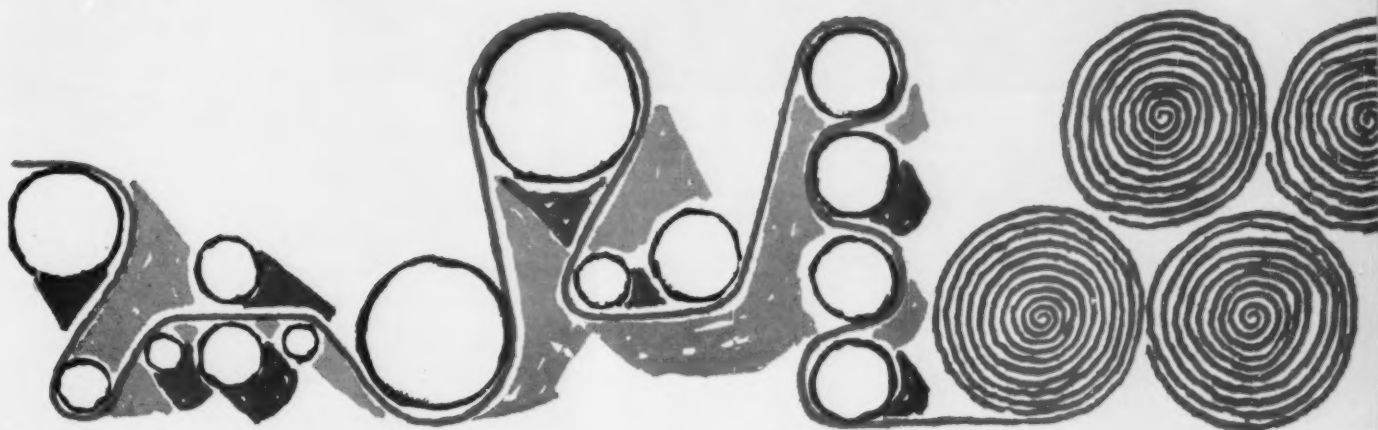


4. No Unscheduled Downtime. We can provide periodic maintenance by experienced service engineers—a big help in eliminating unscheduled downtime. Your instrument technicians are welcome at our Instrumentation Education Center in Philadelphia, where they receive free, expert training in the operation and maintenance of our products.

plan now to
POWER-UP FOR PROFIT ELECTRICALLY



Crown-Zellerbach did
at Port Townsend, Washington



increased capacity . . . reduced unit costs

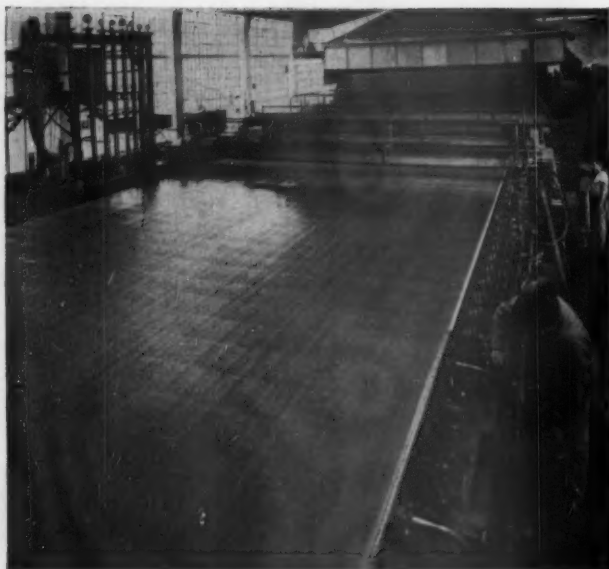
When Crown-Zellerbach Powered-Up the Number 2 paper machine at its Port Townsend plant, a modernized electric sectional drive helped increase operating speed, widen the speed range and provide greater availability. Results . . . increased capacity, reduced unit costs.

You will need more capacity to meet the 40% increase in demand for your products by 1965. Be sure that your electrical equipment will produce profits as well as output. See how Westinghouse helped Crown-Zellerbach to Power-Up the Number 2 paper machine at its Port Townsend plant.

J96136-1

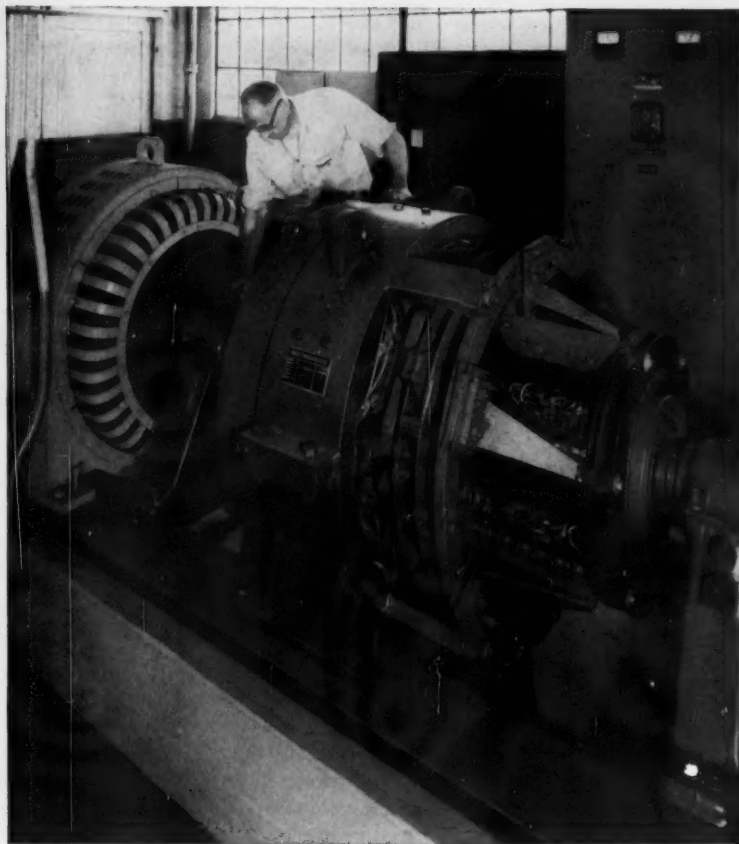
YOU CAN BE SURE...IF IT'S **Westinghouse**

here's how Crown-Zellerbach



Wet end view of modernized Number 2 paper machine in Crown-Zellerbach plant, Port Townsend, Washington.

J-96136-2



This 3000-amp, 75-volt booster generator was added to increase operating voltage and thus permit higher speeds. SLIPSYN® high-voltage synchronous motor control starter for the driving motor is shown in background.

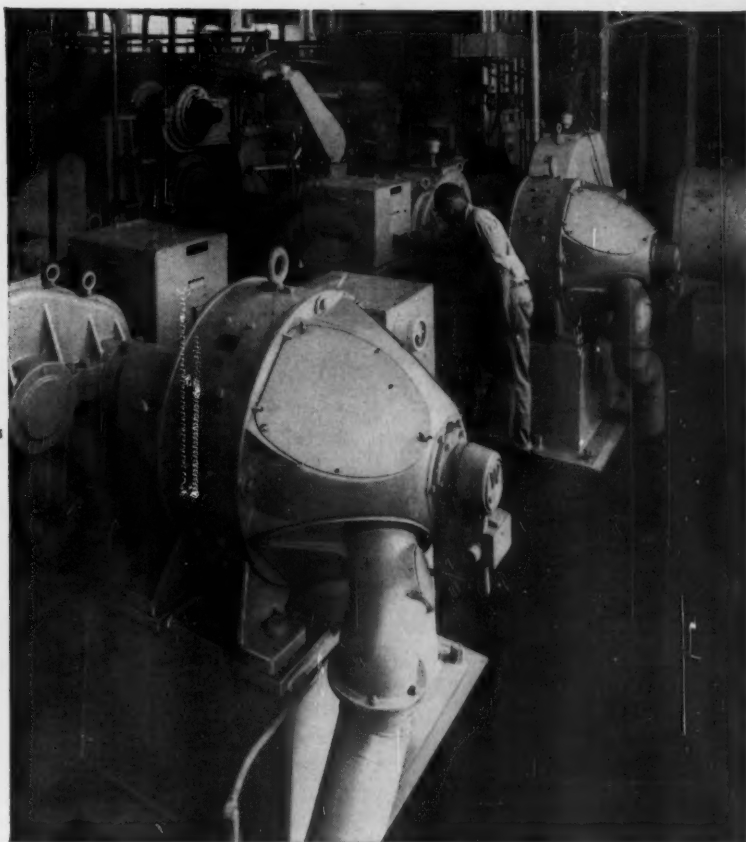
POWERED-UP at Port Townsend

Modernization of the Number 2 paper machine at Crown-Zellerbach's Port Townsend, Washington, plant increased rated top speed from 1050 ft/min to 1750 ft/min. Also, the speed range was widened from 300-1050 ft/min to 480-1750 ft/min. The in-

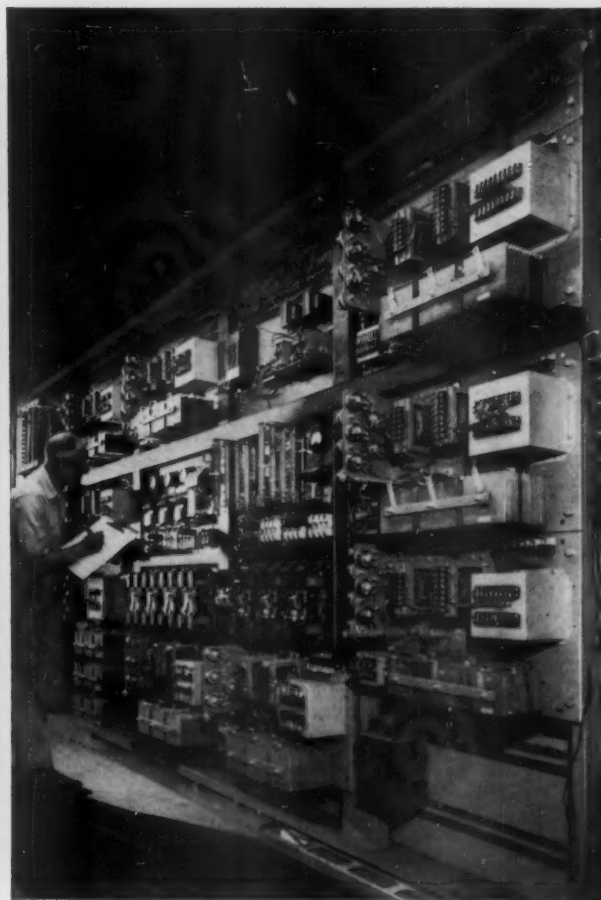
creased operating speed and range flexibility, plus the greater availability provided by static Magamp control, all contributed to a reduced cost per ton. All this was accomplished at minimum cost by building around the existing magnetic control.

J-96136-a

YOU CAN BE SURE...IF IT'S **Westinghouse**



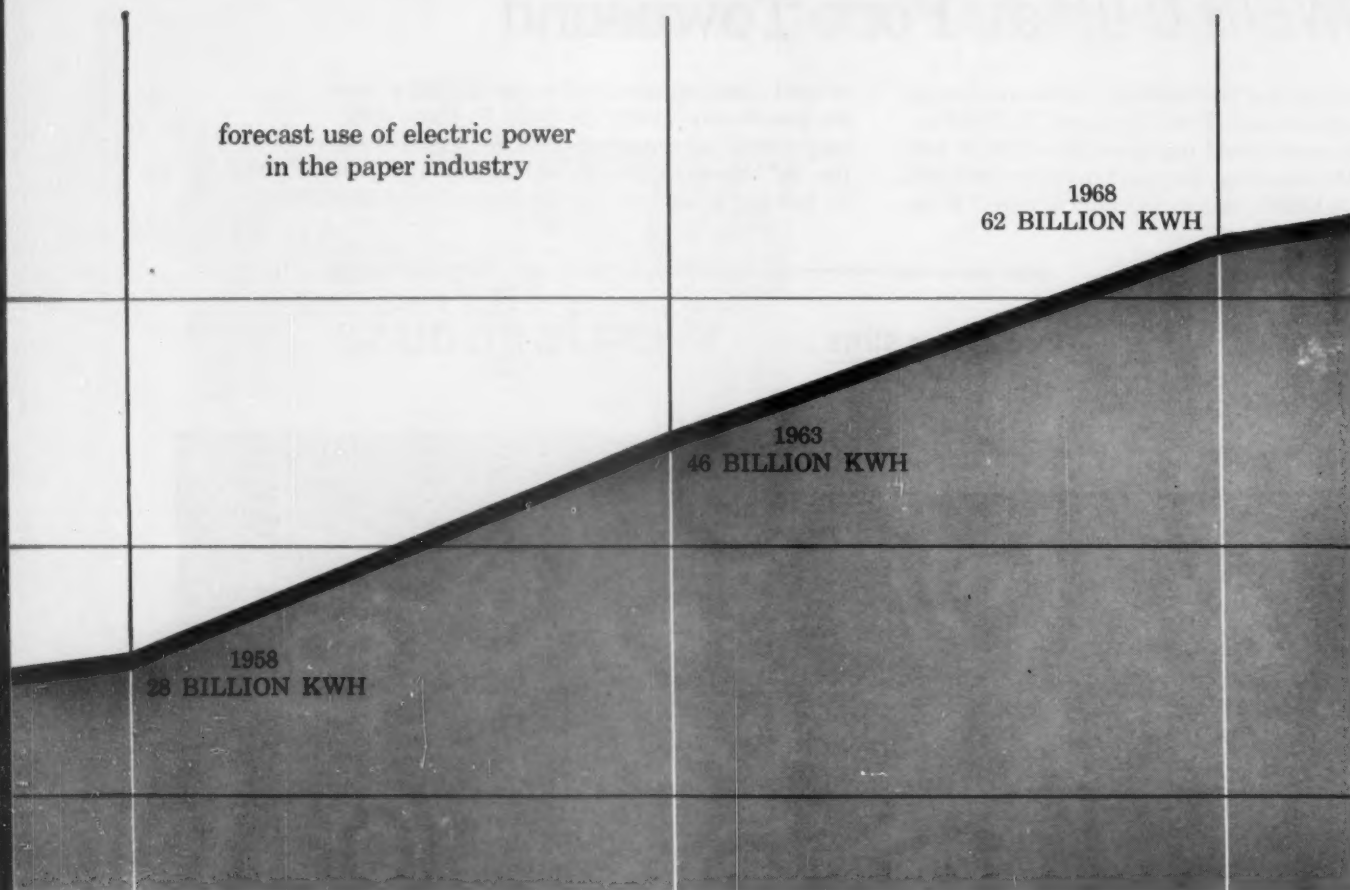
These 100- and 125-hp press motors are integrally mounted with the Westinghouse reducers to conserve space and permit accessibility. These unitized sections were installed to meet the increased power requirements. Drive units on the press section and couch motor are shown in the background.



Lead electrician checks Magamp, a static control-type regulator. The use of static components in this control system results in infinite life and minimum maintenance. Greater machine availability and increased production are assured. Magamp panels were installed in the existing magnetic control board.

here's why you should plan now to

POWER-UP FOR PROFIT ELECTRICALLY



To stay competitive, you will be investing in
a tremendous increase in electrically powered processing machinery.
Be sure it is engineered to produce profits.

Power-Up is a Westinghouse program to help you increase profits through greater productivity. In your plant it may be higher capacity machinery or an engineered control system to provide more uniform production. Whatever the need, maximum use of low-cost kilowatthours can help you earn satisfactory profits.

You will need more capacity to meet the 40%

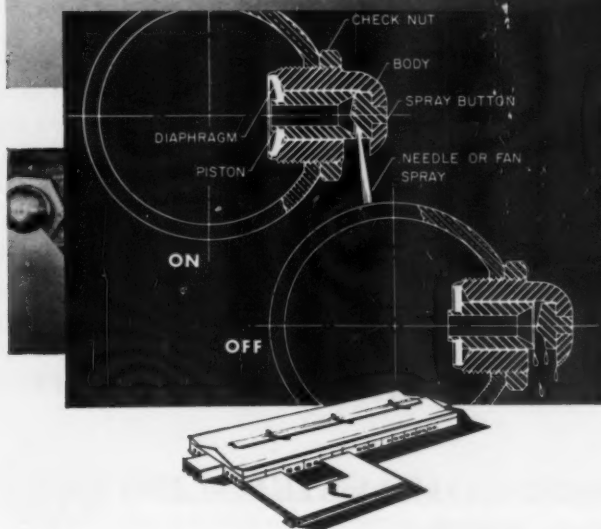
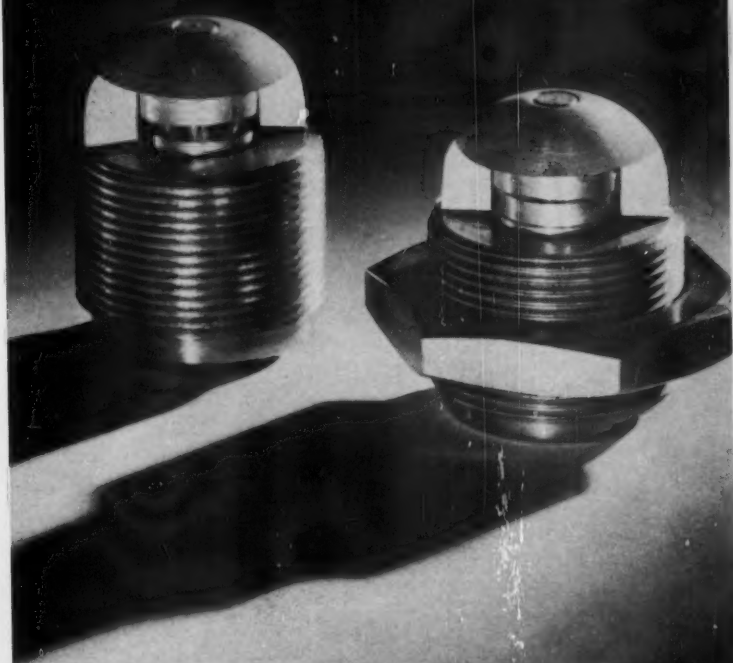
increase in demand for your products by 1965. Be sure—like Crown-Zellerbach—that your electrical equipment is engineered to produce profits as well as output. Call your Westinghouse representative or your utility power sales engineer. They can tell you the electrical steps you can take now to start a Power-Up program in your plant.

J-96136-4

YOU CAN BE SURE...IF IT'S **Westinghouse**

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV FRIDAYS

Conserve water with Lodding Self Cleaning Showers



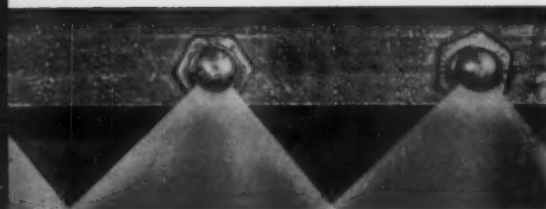
In mill after mill Lodding Showers are conserving water — cutting operating costs — performing effectively.

In showers it's the nozzle that counts. And Lodding Nozzles have been engineered to give you the greatest possible showering efficiency, whether your system uses fresh or clarified white water.

Lodding Nozzles are designed with a built-in, sealed piston. In operation, pressure of the water forces the piston against the spray button, which is precision-milled to create the exact spray pattern desired — from an 80° fan to a needle stream.

As particles become lodged in the nozzle, the piston oscillates and automatically frees them. When the water is shut off momentarily the piston retracts. After the water is turned on again there is a brief period before the piston resumes contact with the spray button. During this interval larger particles are flushed from the nozzle.

It will pay you to investigate all the advantages of Lodding Self Cleaning Showers. Lodding, or one of our sales representatives, will be pleased to tell you more about them.

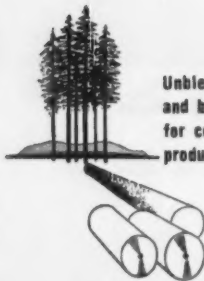


LODDING
Engineering Corporation
AUBURN, MASSACHUSETTS



FRASER PULP*

The swirling white waters of busy streams carry pulpwood from Fraser forests on to river storage or mill wood yard. Constant control of our own raw material supply and scientific production techniques insure sustained high quality pulp production. Backed by abundant forest reserves, Fraser Pulp is a secure, continuous source of supply for fine quality pulp.



Unbleached kraft pulp
and bleached sulphite pulp
for cellophane, rayon and the
products of paper.

**It's a Fraser Product*

FRASER COMPANIES, LIMITED

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MILLS: CAMPBELLTON, N.B., CANADA

NEWCASTLE, N.B., CANADA

HYDRAFINE SUCCESS STORY



from sample can to carload in one year

Rarely has a new material been accepted so readily by paper and boxboard manufacturers as Hydrafine. Mills that tried sample cans last year are now ordering carloads of this new coating clay!

In *paper coating*, Hydrafine excels in developing high brightness and gloss. In *boxboard coating*, Hydrafine gives maximum brightness and covering power at low coat weights. A clay of *extreme fineness*, Hydrafine is spray-dried in the pre-dispersed form preferred by many manufacturers. Hydrafine is also available in lump and pulverized form.

Hydrafine is produced by Huber's patented Viscontrol process, which eliminates viscosity fluctuations normally found in all kaolin crudes.

SPECIFICATIONS:

Particle size—90-94% finer than 2 microns

GE Brightness—86-87%

Controlled low viscosity, as in all other Huber clays.

Join the growing ranks of satisfied Hydrafine users: write for your sample today!



J. M. HUBER CORPORATION, 630 THIRD AVENUE, NEW YORK 17, N. Y.

Clays and printing inks for the container industry.

Masoneilan 60000 Series Controllers Feature Plug-in Connections, Manifolded Air Circuits



This is the Manifolded Backplate which carries the air circuits and supports the controller components. Gimbal Unit is shown moving towards the plug-in connection. Red lines trace air circuits located on back of plate.

The manifolded backplate . . .

- Eliminates exposed tubing and pressure fittings
- Protects air circuits
- Provides base for mounting plug-in subassemblies
- Permits easy access to operational units for interchange and servicing

Masoneilan 60000 Series Pneumatic Controllers are designed for utmost simplicity and ease of servicing, with a big plus in ready interchangeability of operational units — gimbal unit, nozzle, proportional unit, reset unit and gauges — by means of plug-in O-ring connections. The manifolded backplate provides a rigid base for components; protects air circuits; eliminates exposed tubing and pressure fittings; avoids leakage. Pilot mani-

fold block allows quick, easy connection of manual control unit.

Result: An instrument offering maximum simplicity and accessibility.

This is only one of the design features which have given the 60000 Series such a fine reputation for dependable, accurate performance; versatility in application; and minimum attention. Complete details available from the nearest Mason-Neilan representative or write

MASON-NEILAN

Division of Worthington Corporation

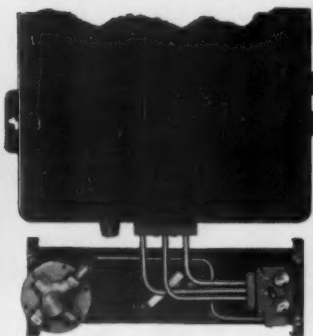
65 NAHATAN STREET, NORWOOD, MASSACHUSETTS

District offices or Distributors in principal cities in U. S.

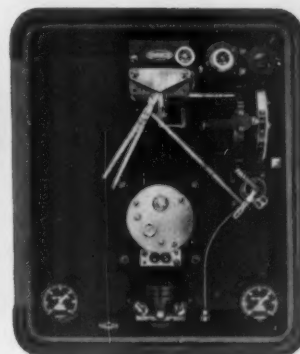
In Canada: Division of Worthington (Canada), Ltd., Mason-Neilan



Proportional and Proportional-Reset Units are easily and quickly interchangeable.

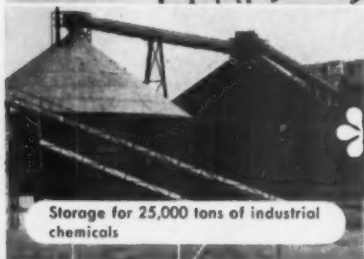
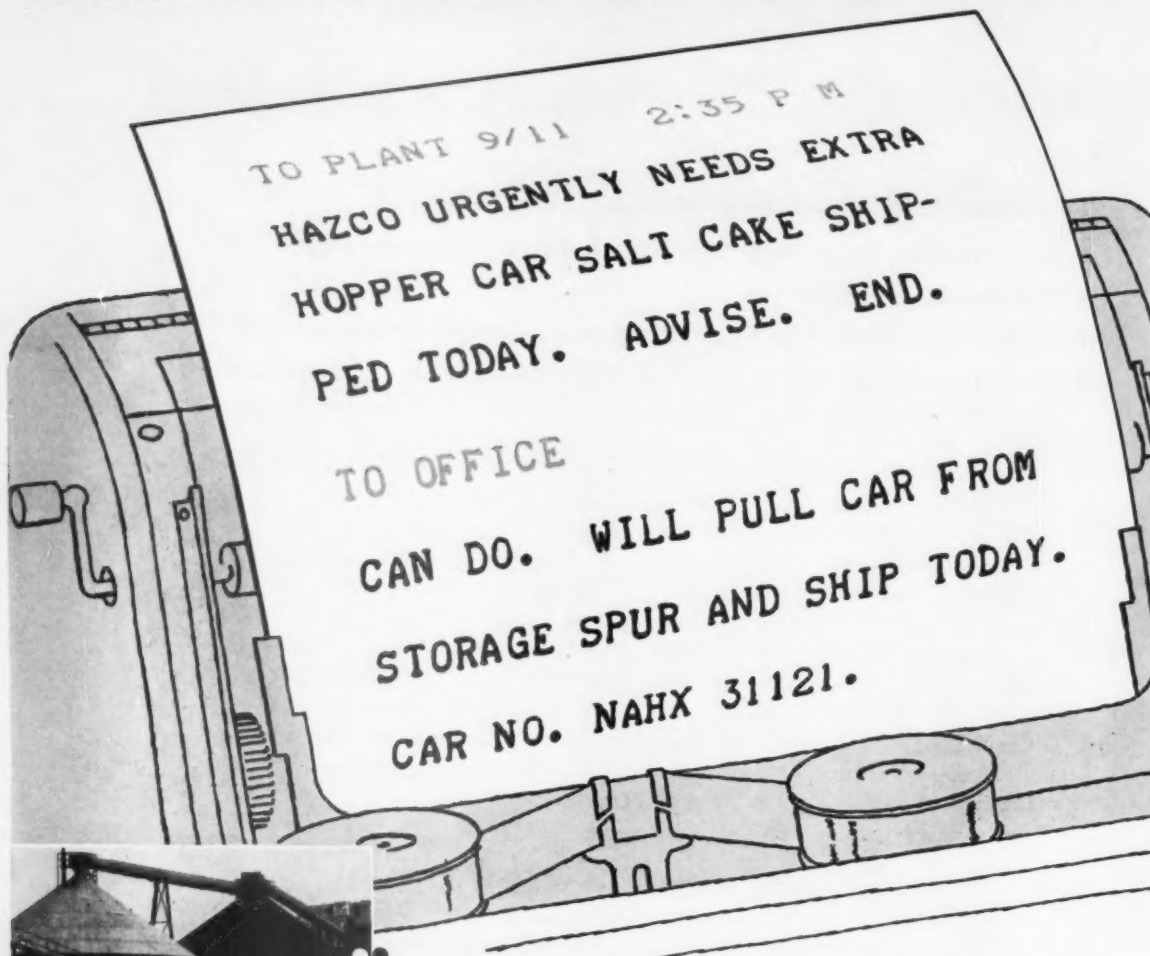


Manual Control Subpanel. Four position transfer switch connects to pilot block by tubing manifold. Operator can select manual, start-up, test, service, and automatic control.



Interior View of Controller shows the accessible, easy-to-service design. There is plenty of room to work; interchangeable components provide trouble-free operation.

West End "fills the order"...



Storage for 25,000 tons of industrial chemicals



Immediate shipment in leased hopper cars



Vast natural source of raw material

Meeting service requirements to the letter and producing superior salt cake of consistent chemical analysis are the essentials to which the West End organization is uniquely geared. A system of rapid communications linking our sales office in Oakland with our production, technical and shipping departments at the desert plant site permits each department head to have a complete understanding of the customer's individual requirements and to make firm commitments or provide the desired information promptly.



WEST END CHEMICAL COMPANY

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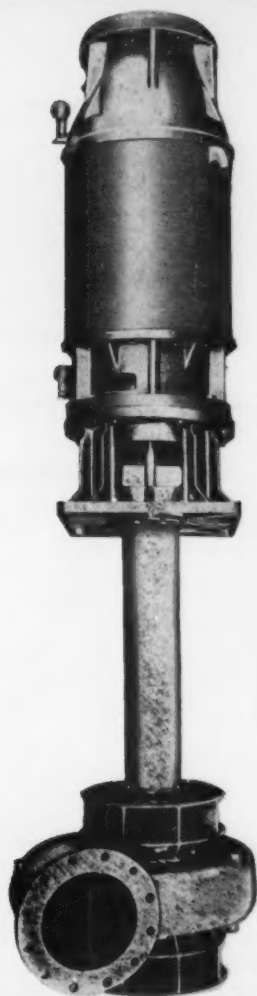
DIVISION OF **Stauffer** STAUFFER CHEMICAL COMPANY



Bingham

TYPE "VS" DOUBLE SUCTION DOUBLE VOLUTE VERTICAL PUMP

SPECIALLY DESIGNED FOR PULP AND PAPER MILL SERVICE...CANNOT BECOME AIR-BOUND OR CLOGGED



REQUIRES ONLY MINIMUM-SIZE WET PIT

Bingham Type "VS" Pumps are being used as standard equipment throughout the Pulp and Paper Industry for handling stock, white water, water supply, disposal sump and other high capacity, medium head services. The vertical "VS" Pump requires only a shallow sump of minimum dimensions, permitting installations to be made on the same floor with flat screens, deckers, washers, save-alls, etc.

The "VS" Double Suction Pump has large suction openings and specially-designed impellers to handle air-entrained white water or stock without becoming air-bound or clogged.

The "Double Volute" design of Bingham VS Pumps insures radial balance of the rotating element throughout the entire operating range of the pump. This feature prevents wear of rotating parts due to the elimination of shaft deflection usually caused by "SIDE PUSH".

The "Double Suction" feature of this pump eliminates axial hydraulic thrust thereby permitting the use of standard vertical motors.

For complete information call your nearest Bingham office, or write for brochure 110.

Outstanding features of the Bingham "VS" Pump:

1. Will not become air-bound.
2. Will handle stock without clogging.
3. May be installed at convenient locations in mill flow line.
4. Operates successfully in basements or on any floor level.
5. Eliminates need for secondary dump chests.
6. Substantially reduces building costs.



Battery of Bingham Type VS, "Double Volute", Double Suction, Wet Pit Pumps handling 36 million gallons of white water per day from flat screens located on the same floor level in a large West Coast pulp mill.

Bingham

SINCE 1921

BINGHAM PUMP COMPANY

General Offices: 2800 N.W. Front Avenue, Portland 10, Oregon
Factories: Portland, Ore. • Vancouver, B. C., Canada



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POWELL has high pressure
high temperature valves in stock for quick delivery

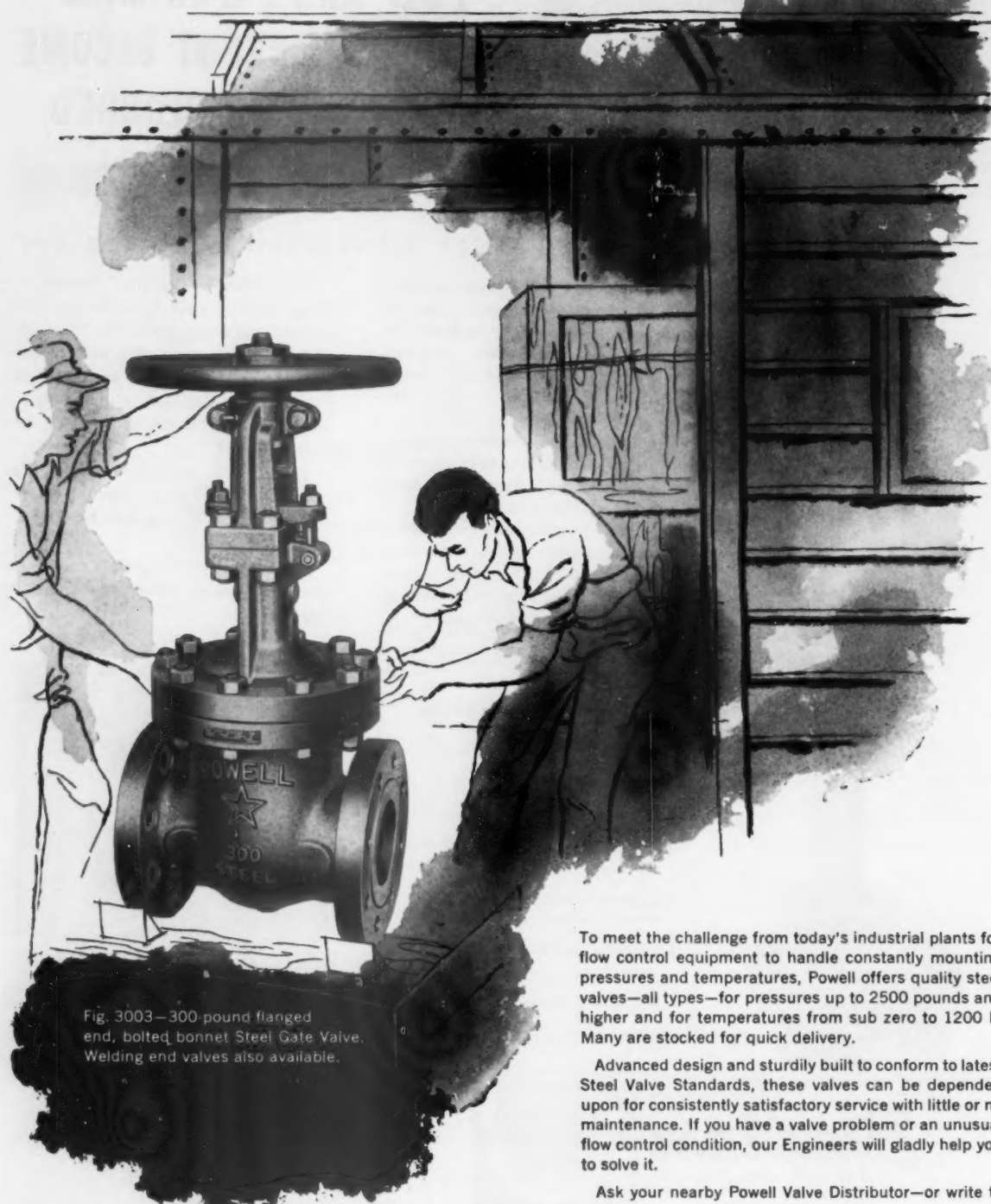


Fig. 3003—300-pound flanged
end, bolted bonnet Steel Gate Valve.
Welding end valves also available.

To meet the challenge from today's industrial plants for flow control equipment to handle constantly mounting pressures and temperatures, Powell offers quality steel valves—all types—for pressures up to 2500 pounds and higher and for temperatures from sub zero to 1200 F. Many are stocked for quick delivery.

Advanced design and sturdily built to conform to latest Steel Valve Standards, these valves can be depended upon for consistently satisfactory service with little or no maintenance. If you have a valve problem or an unusual flow control condition, our Engineers will gladly help you to solve it.

Ask your nearby Powell Valve Distributor—or write to us direct.

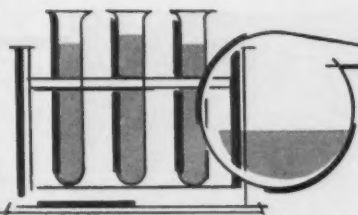
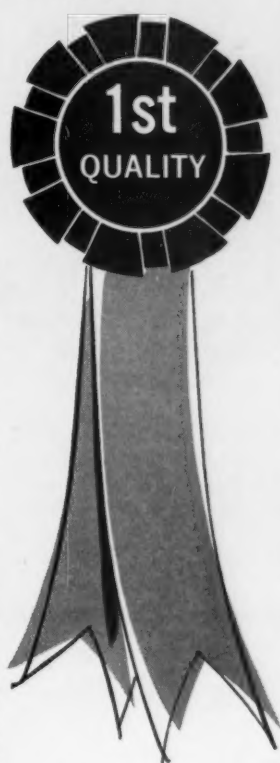
Look us up at the 27th Exposition of Chemical Industries, New York City
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THE WM. POWELL COMPANY DEPENDABLE VALVES SINCE 1846 CINCINNATI 22, OHIO **world's largest family of valves**

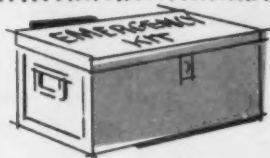
YOU BENEFIT 5 WAYS

with SOLVAY CHLORINE!

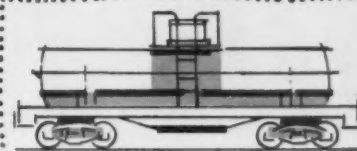
PRODUCT You get chlorine made by America's foremost producer of alkalis. Outstanding in a line that has set the industry's standards!



SERVICE You get the help of chlorine specialists in Solvay Technical Service working on your problems. Fast aid and expert literature in the use, handling and storage of chlorine for textiles, paper, water, sewage.



SAFETY You get safety programs and equipment pioneered by Solvay. Emergency Kits you can buy or borrow for cylinders, 1-ton containers, tank cars. Safety wall charts displaying vital unloading, handling, first aid facts.

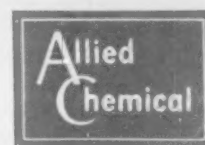


PACKAGING You get Solvay® Liquid Chlorine in the package most convenient for you. Tank cars—32,000 lbs., 60,000 lbs., 110,000 lbs. Multiple unit cars of 15 1-ton containers. 150-lb. cylinders.



DELIVERY You get carload and l.c.l. orders speedily from production centers in Syracuse, N. Y., Moundsville, W. Va., Hopewell, Va., Brunswick, Ga., Baton Rouge, La. and a network of distribution points.

Sodium Nitrite • Calcium Chloride • Chlorine • Caustic Soda
Caustic Potash • Potassium Carbonate • Sodium Bicarbonate
Chloroform • Methyl Chloride • Soda Ash • Vinyl Chloride
Ammonium Chloride • Methylene Chloride • Carbon Tetrachloride • Snowflake® Crystals • Monochlorobenzene • Orthodichlorobenzene • Paradichlorobenzene • Ammonium Bicarbonate • Hydrogen Peroxide • Aluminum Chloride • Cleaning Compounds • Mutual® Chromium Chemicals



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61 Broadway, New York 6, N. Y.

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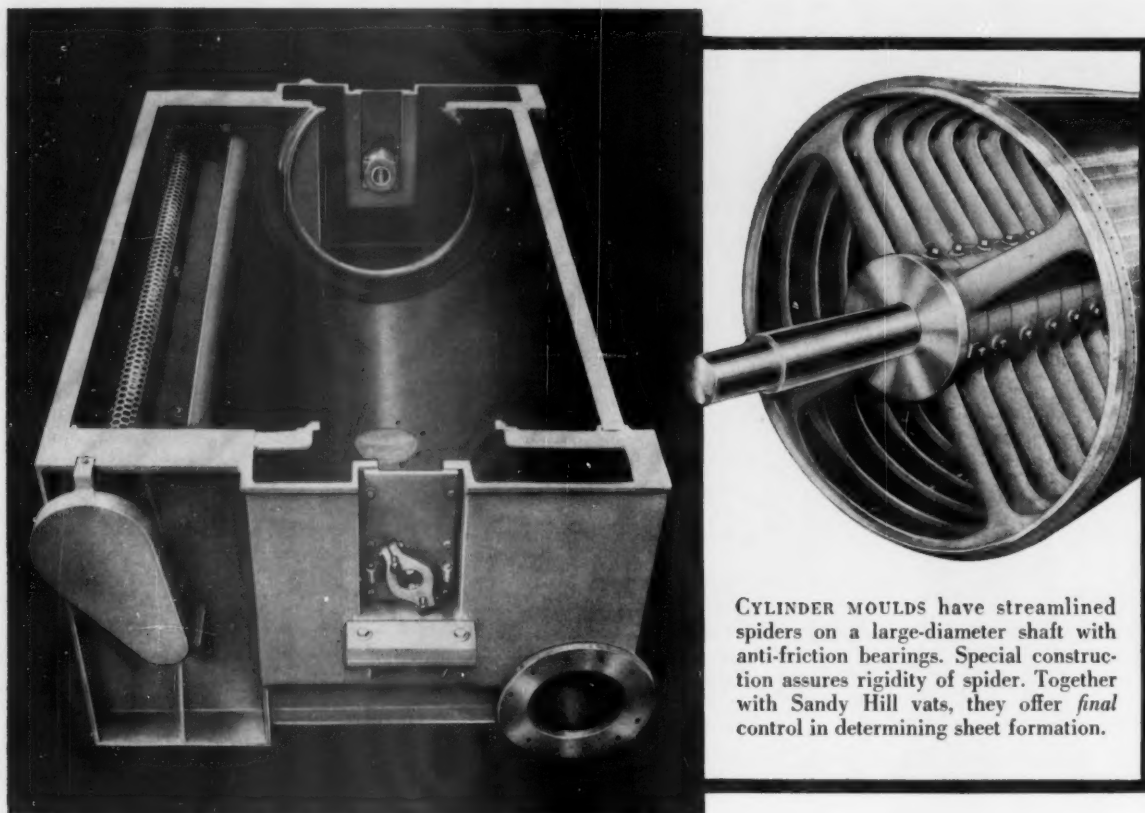
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SANDY HILL CYLINDER MOULD VATS

help you make better paperboard



CYLINDER MOULDS have streamlined spiders on a large-diameter shaft with anti-friction bearings. Special construction assures rigidity of spider. Together with Sandy Hill vats, they offer *final* control in determining sheet formation.

SANDY HILL VATS offer superior inflow and outflow capacity. Inflow distributor roll gives better fiber dispersion and uniformity of cross-machine caliper. Can be all stainless steel, cast iron ends with cypress circle and baffles, or copper-or-monel-lined cypress.

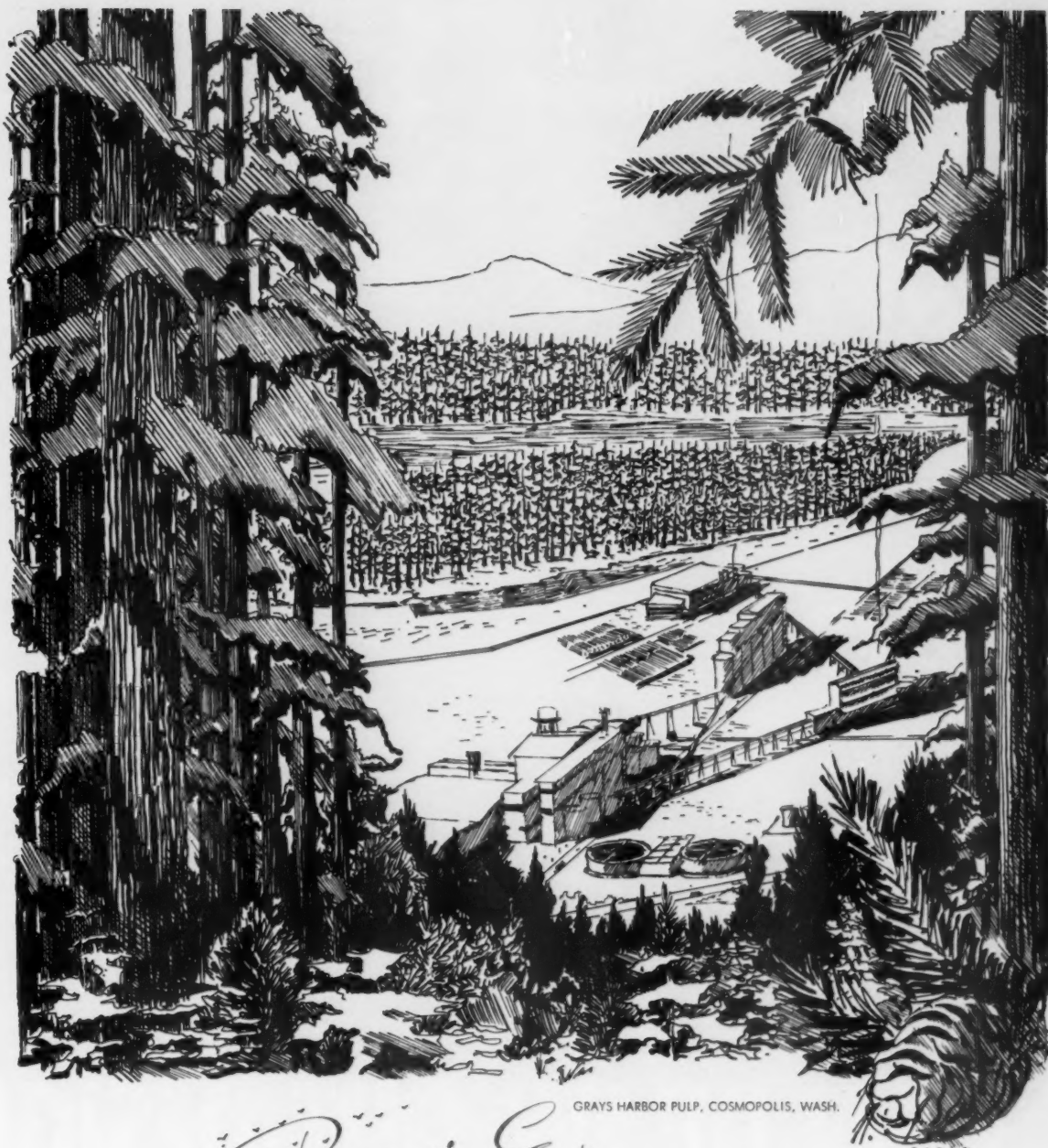
Illustration shows counterflow vat. Direct flow vat available.

Tell us your vat requirements in terms of your product and your mill's production aims. Then, let us put your experience and ours together and see about reaching those aims in the most economical way. This kind of cooperation has led to more profitable mill operation in every part of the country !

• *Phone or write today, for full information.*



THE
SANDY HILL
IRON AND BRASS WORKS
HUDSON FALLS, N. Y.



GRAYS HARBOR PULP, COSMOPOLIS, WASH.

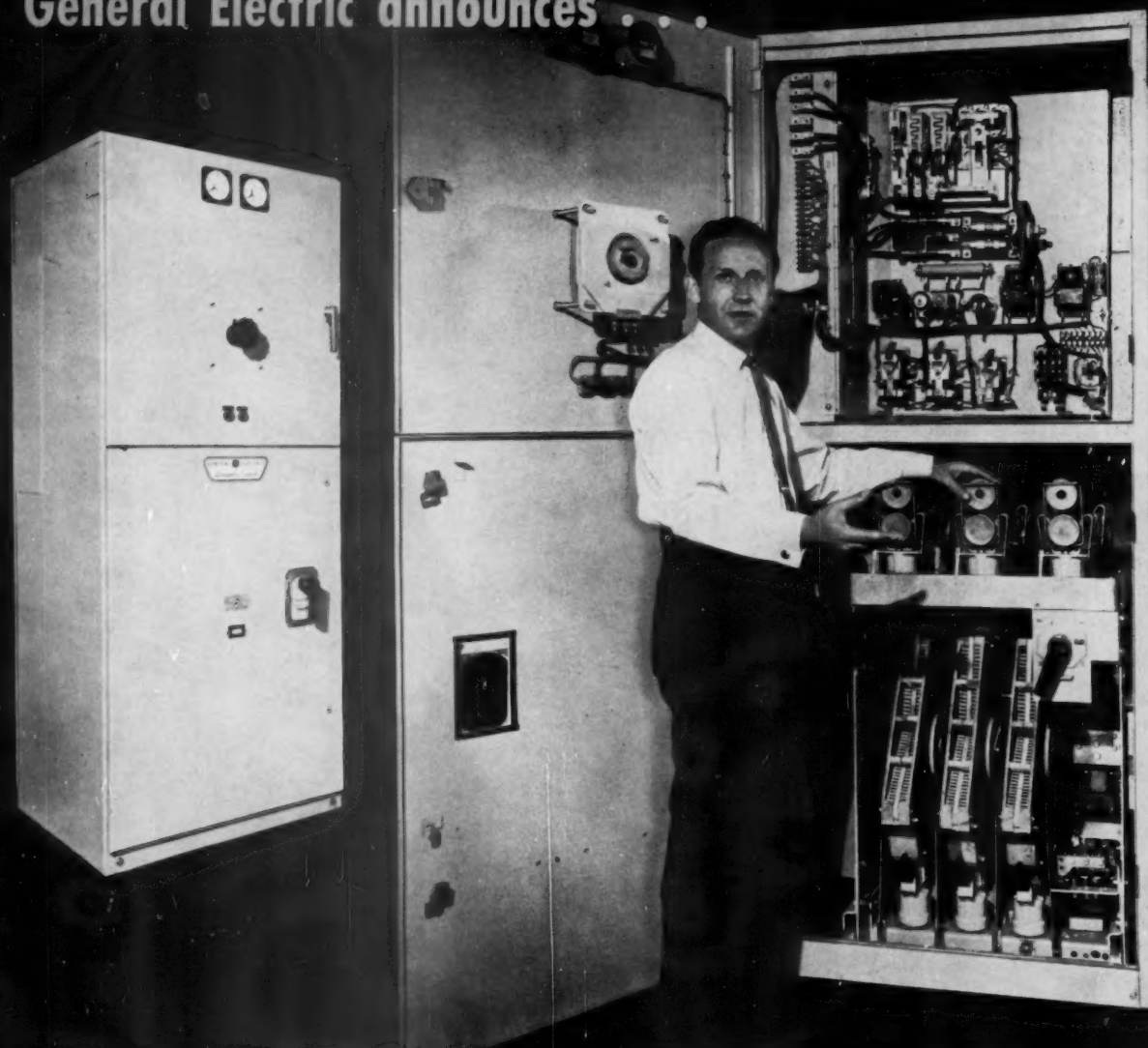
Bird's Eye **VIEW**

The new Grays Harbor Mill, eighty miles south of Tacoma, converts timber into pulp in a continuous operation. From its 10-acre woodyard to finished pulp warehouse, the Grays Harbor operation is under the close supervision of Weyerhaeuser research people who are constantly on the lookout for improved pulping methods.

WEYERHAEUSER



General Electric announces . . .



NEW DRAW-OUT DESIGN

From General Electric comes the all-new draw-out Limitamp control—today's most advanced medium-voltage motor starter. Designed for the control of a-c motors rated 2300 through 4600 volts and up to 3000 hp, this new air-break starter has broad application throughout industry.

Since its introduction in 1941, Limitamp control has established a reputation for being first with the design features that add up to major user benefits. And, today's all-new Limitamp control follows this pattern with a host of design innovations that make for:

Faster installation: When you're ready to roll in the contactor—it can be done easily by one man. And,

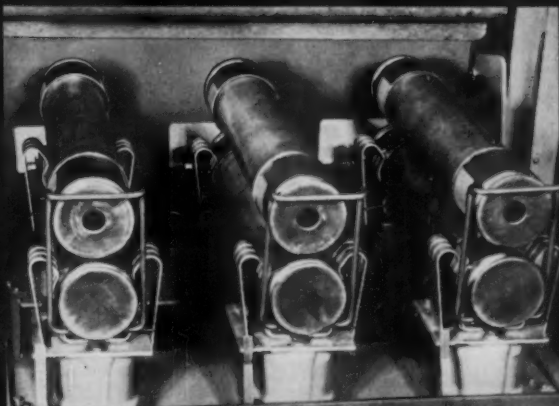
there are no connections to make—they are made automatically as the contactor rolls into place. There's plenty of space inside the panel for pulling the motor and power cables . . . and making the connections. And, with the new design, floor sills have been eliminated. This means no more grouting, no expensive cement work, simplified lineup with other panels.

Simpler, safer operation: One handle now controls the complete operation of connecting and disconnecting the starter from the bus and mechanically locking the high-voltage compartment door. A unique interlocking system protects the unit from misuse.

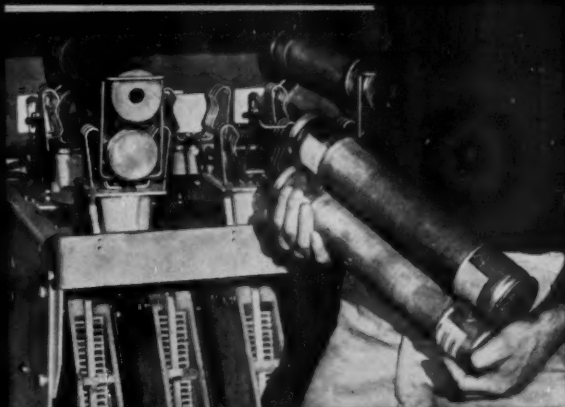
Superior protection: General Electric's new Limitamp



INSTALLS IN HALF THE TIME—Draw-out air break contactor, roomy isolated cable compartments, and increased working space help simplify installation.



LIMITAMP CONTROL IS ISOLATED AUTOMATICALLY—A unique shutter box isolates the starter from high-voltage power when the operating handle is turned to the off position.



INTERRUPTS FAULT IN FIRST $\frac{1}{2}$ CYCLE—Fast-acting, current-limiting fuses interrupt circuit before short circuits cause damage to valuable motors.



NORMAL MAINTENANCE WITH CONTACTOR IN PLACE—All components, including the high-voltage contactor, can be maintained right in the control unit, with complete safety.

LIMITAMP* CONTROL

control utilizes fast-acting current-limiting fuses, ambient-compensated overload relays, and a high-voltage contactor to provide the most "positive" protection for your motors. Proved EJ-2 fuses interrupt a fault in the first $\frac{1}{2}$ cycle, thus reducing damage to valuable motors. The performance of the completely coordinated design has been exhaustively tested in General Electric's high-voltage laboratory to provide the most reliable equipment for your application.

Easier maintenance: Even with these advanced design features, new Limitamp controls are simpler than ever to maintain. All components are accessible from the front for inspection and maintenance—without removing them from the enclosure. A special test circuit is

built into each unit—permitting check-out operation before the unit is put into service.

For full information on all-new Limitamp motor control, contact your G-E Apparatus Sales Engineer or Agent today. Or write Sect. 783-10, General Electric Co., Schenectady, N. Y., for Bulletin GEA-6893. Industry Control Dept., Roanoke, Virginia.

*Reg. trade-mark of General Electric Company.

Progress Is Our Most Important Product

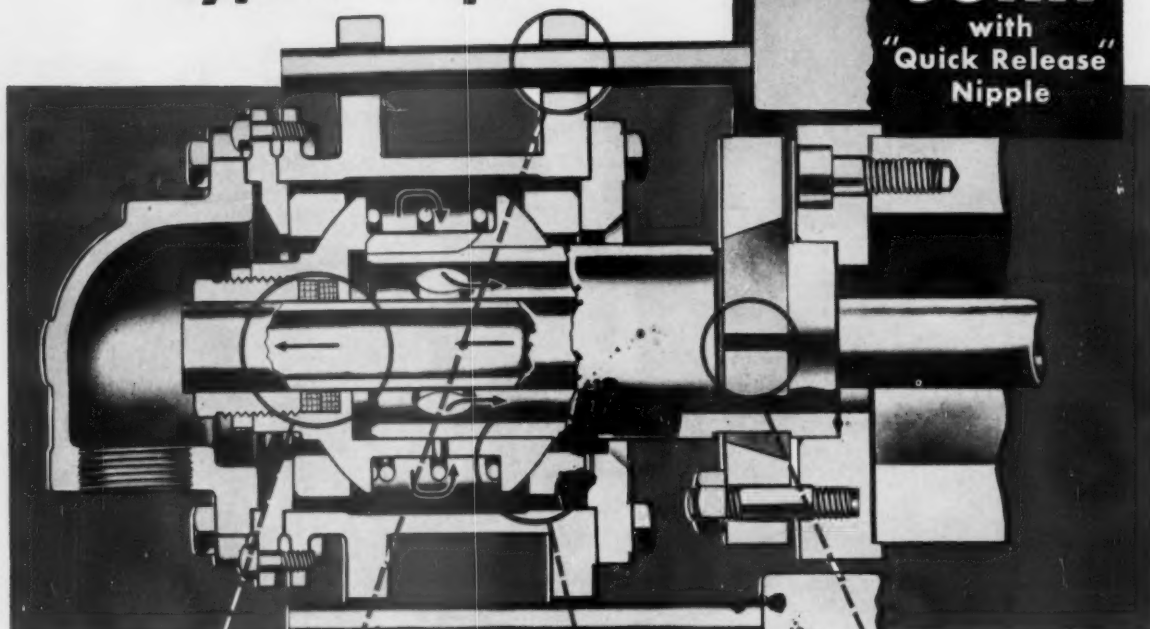
GENERAL  ELECTRIC

and for Paper Machines with **ROTATING** Syphon Pipes

SUPER
Type L-N

**Johnson
Joint**

with
"Quick Release"
Nipple



Best Design Yet

Rotating syphon pipe does not rotate in the packing; thrust collar, nipple, packing gland and syphon pipe all rotate together as a unit. Joint needs no lubrication or adjustment. Time-proved construction has only a few simple parts—a design which thwarts trouble, permits easier field servicing. Assembly plate provides ready access to syphon pipe. Type L-N Johnson Joints are available in sizes from 1/2" through 8".

Floating Action

Simple rod supports carry all the weight of the body and connections—permit the rotating assembly to "float" freely inside. Can be adapted for machines with open or enclosed gearing.

Easy On . . . and Off

Johnson "Quick Release" Nipple utilizes powerful wedging action to lock nipple securely to journal. You install the joint or remove it for inspection—with just an end wrench; no danger of damaging nipple with heavy pipe wrenches.

Super Construction . . . and Stamina

Teams "Green Streak" seal rings, of much harder and denser structure, with Ni-Chrome plating on wearing surfaces. Results: Considerable reduction in friction load and much longer service life.

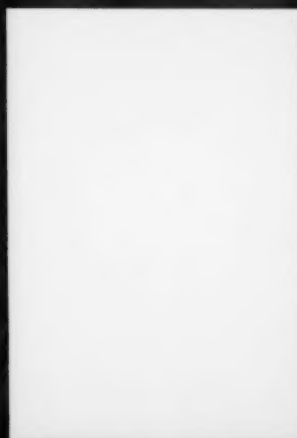
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THE JOHNSON CORPORATION

849 WOOD STREET • THREE RIVERS, MICHIGAN

Rotary Pressure Joints • Direct Operated Solenoid Valves



WHERE
OPACITY
COUNTS —



O-110

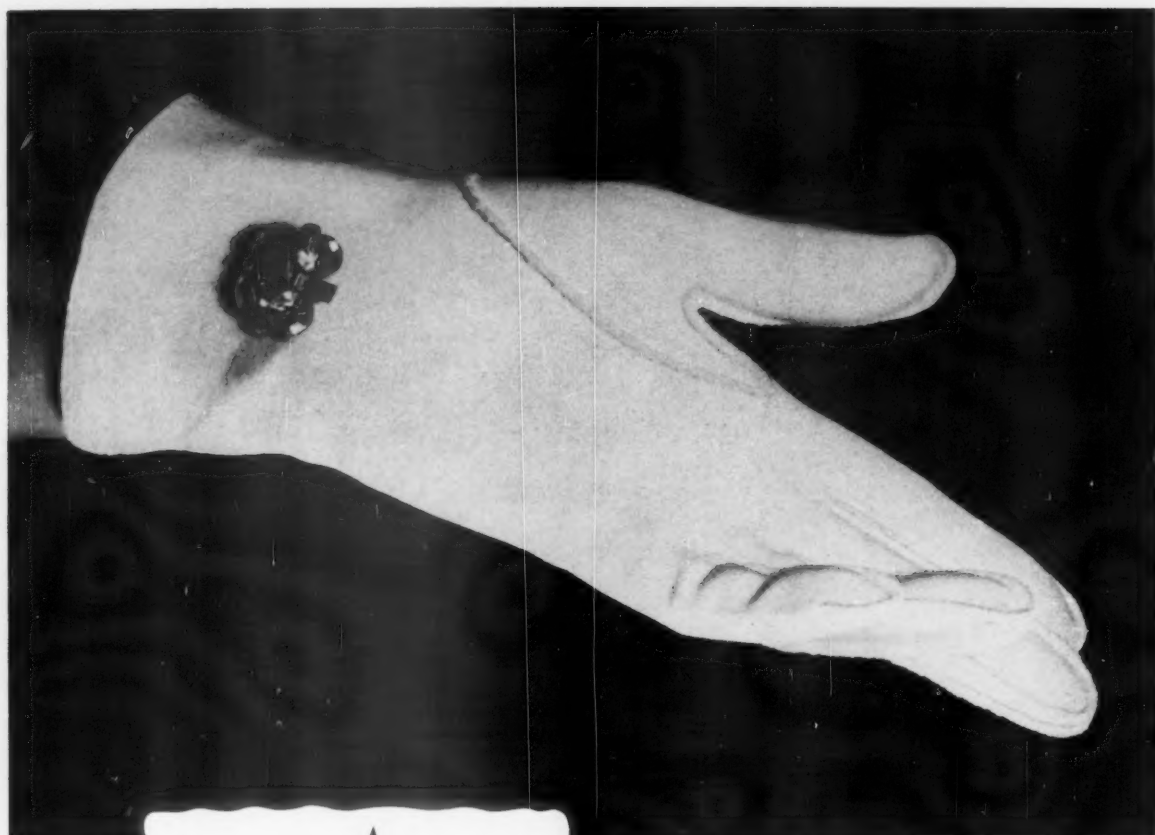
Titanium Dioxide

**MAKES LIGHTWEIGHT PAPERS
DO THE JOB OF HEAVYWEIGHTS!**

Ask your Cyanamid Pigments representative about UNITANE O-110.



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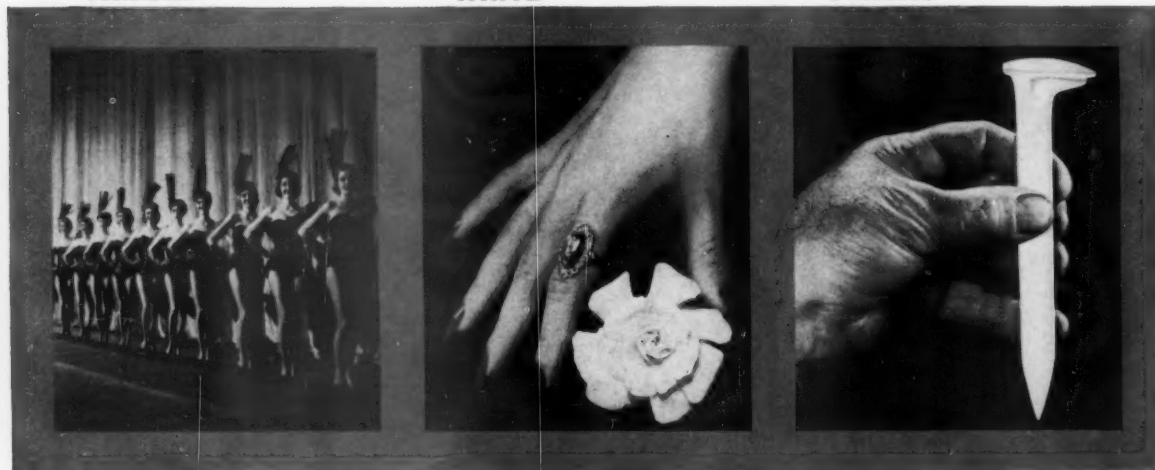
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PUGET SOUND PULP & TIMBER CO.
BELLINGHAM • WASHINGTON

UNIFORM

WHITE

STRONG



THE

Langston Leader

Leadership...by design

SAMUEL M. LANGSTON CO. • CAMDEN 4, N. J.

PAPER
MILL
EDITION

NOVEMBER, 1959

Published for the information of paper and board mills

VOL. 1, NO. 6

MEN TO RELY ON

Never in the two thousand years of paper manufacturing has the vista for the paper and board industry been broader nor the competition keener. More importantly than ever before, the industry lives in a situation of challenge and striving to meet the challenge.

Competition in the plastics field, for example, is spurring the industry to achievements far beyond past endeavors. Research, wide-awake engineering, new techniques—these are applied day by day perhaps more intensely than ever before.

Langston is proud to play a role in this increased scientific and technical activity. Our engineers and our service force are proud to join papermaking in meeting the modern challenges. Trained in depth, we have field-grounded knowledge of

paper-making problems, particularly at the end of the machine and in the finishing room.

For those of you who may not know them intimately, we have prepared this edition of the Langston Leader to introduce Langston executives and engineers. They are daily devoting know-how—gained from 60 years of Langston manufacturing—to the solutions of current problems of slitting, winding and finishing paper and board.

These are men whom many in the industry have come to know and rely on. We are sure many more of you will get to know them even better as the challenges of our times are met—with confidence, experience and intelligent application of skills.

PRESIDENT

LANGSTON SKILLS AID PAPER INDUSTRIES

Slitter and Winders Reflect Long Experience, Depth in Know-How of Engineering Team

The Langston engineering staff brings to the paper and board industries three outstanding qualities—skill, depth and vision. These are the pillars on which Langston leadership in design is based. They are the foundation for the company's steady contribution for nearly 60 years to paper and board manufacturing.

The company's participation with the industry in machine development goes back to Langston's first "slitter head" patent, granted in 1902. The famous slitter head, heart of the Langston slitting equipment, led to our legend "Shear Cut, Clean Cut." These, the paper-making industries learned, were not idle words. Langston winders with the shear cut slitters eliminate the dust often created when heavy and short-fibered paper stock is cut.

Over the years, skill, depth and vision were combined with wide experience and intensive research to produce engineers geared to meet today's rigid production requirements. They are constantly planning for the future growth of the paper and board industries.

Ever-Widening Vistas

Langston engineers are always developing improved methods and

machines as they refine those already in use, incorporating in Langston design the best in mechanical, electrical and hydraulic equipment. Faster speeds, lower setup times, more efficient techniques—these are day-to-day objectives. But planning and testing fresh approaches are a vital part of the operation.

Close consultation with management and operating personnel of paper and board mills gives Langston executives and engineers opportunity to participate in every immediate development and to see what the future will require. This keeps a corps of experienced engineers on top of current problems. And it keeps alive the Langston tradition of advanced engineering research.

Examples of Langston's progressiveness are embodied in features of the Langston winder and shaftless backstand. The features combine to play an important part in the production of consistently higher quality rolls. Outstanding among these are the patented hydraulic roll density controller, the hydraulically operated roll ejector, hydraulic lifting of the rewind shaft bearing brackets and automatic braking of the winding drums and idlers.

The new Langston shaftless unwind



Bryant W. Langston

stand is designed for one-man operation. It saves time and eliminates the bullwork often a part of shaft-type operations. Contributing to greater efficiency and higher quality backstand work are such features as automatic web alignment and side register control, web oscillation and automatic braking of idler rolls.

President Leads Team

President **Bryant W. Langston** personifies the continuity and solidity of Langston services. After study at Cornell, he started as a machine erector in 1932, later served western customers as sales engineer, before long became widely

(Continued on Page 2)



Walter J. Goettsch
senior vice president



Louis J. Baudis
executive vice president



H. Clifford Mayhew
vice president—customer services



E. B. Seeger
vice president—sales



George E. Brown
treasurer

(Continued from Page 1)

known among management in the paper, board and corrugated industries. For the last 13 years he has been the guiding hand of the organization.

At the top of the team is this combination: Walter J. Goettsch, Senior Vice President; Louis J. Baudis, Executive Vice President; E. B. Seeger, Vice President—Sales; and H. C. Mayhew, Vice President—Customer Services.

Walter Goettsch contributes to the company about 42 years of experience gained in board mills and corrugating plants in this country and abroad. He joined the Langston organization in 1922, bringing with him machine building and operating "know-how" acquired at the Sefton Manufacturing Company, The Midwest Box Company and The American Strawboard Company. He has been in continuous and close contact with the many problems and resultant developments arising out of the demands for higher machine speeds, more exacting quality standards and greater efficiency generally.

Varied Experience

Lou Baudis has been a Vice President since 1955, was named Executive Vice President in 1956. Before coming to Langston, Lou had a 20-year career in developmental work at the Bullard Company, Bridgeport, Conn. Evidence of his work there can be seen in many of today's most modern and efficient machine tools. At Bullard, he started in shop training work, went through methods and time study and then became Assistant to the Vice President in charge of Manufacturing, with membership on the Board of Directors.

Ed Seeger carries an excellent record in the field. An engineering graduate of the Merchant Marine Academy, Ed has been with the company 14 years. He has traveled extensively in the U. S. and in Europe and in many countries has won high regard for his keen appreciation of machinery and how to make it effective. His vigor, skill and leadership have inspired the engineering sales force to the highest standard of customer service.

Cliff Mayhew began his career at Langston 33 years ago. Cliff is the man who sees to it that orders and requests are carefully checked, then gets things on the road. A constant stream of inquiries by letter and telephone flows over his desk. When action is needed he channels the order in the right direction and sees that it's executed. He also keeps an eye on quotations for equipment, service and parts. And he plays an important role in company advertising and public relations.



CHIEF SERVICE SUPERVISOR Bill Schroeder, left, and assistant supervisors George Crispin, Jr., and Bill Ross.

Paper Industry Know-How

To direct the engineering team, Lou Baudis calls on the able assistance of Chief Engineer **Henry W. Moser**. Henry is a native of Switzerland and a graduate in 1944 from that country's Institute of Technology at Winterthur. After the Institute, Henry had intensive training in machine shop work. His interests directed him toward Swiss newsprint and fine paper mills and for several years he worked in this field as a plant engineer.

In 1947 Henry went to Masson Scott Company, Ltd., of London, England, internationally-known manufacturers of heavy machinery used in the paper industry. He joined Langston as a design engineer in 1953. He soon proved his capacity for increased responsibility and earned the highest regard of both colleagues and customers. In September, 1955, he was promoted to Chief Engineer.

Less than a year later, Langston was able to report: "Since the activities of the Engineering Department have been directed by Lou Baudis and Henry Moser, more than half of our engineering effort has been devoted to research and new machine developments." This meant a sharp rise in design engineering personnel. It meant increased working hours in this field. And it set the pace for a continually expanding engineering and research program.

Introducing More Engineers

To carry this out, Moser has four strong right arms: William J. Emerson, James T. Ferara, Assistant Chief Engineers; John Paterson, Assistant to

the Chief Engineer; and Thomas C. Karanzalis, Administrative Engineer. The entire engineering staff totals 53.

Bill Emerson and Jim Ferara devote most of their time to the customers' order section of the Langston Company's business.

Bill Emerson, a mechanical engineer, is a graduate of Drexel Institute of Technology in Philadelphia. His record there earned him a scholarship for an extra year's study in business administration and psychology. Ten years with Langston, he has worked as a design engineer and has taken part in many of the major developments for which the company is responsible.

Coordinating The Team

Jim Ferara also was trained at Drexel. He started with Langston as an engineering trainee in 1936 and worked his way up through every phase of machine design and development. For a number of years, Jim was responsible for contract specifications. He was the coordinator between Engineering and Production. His experience gave him a reputation as a man thoroughly schooled in design and always alert to new possibilities in machine development.

Jack Paterson, Henry Moser's assistant, also was trained at Drexel. With Langston for 11 years, he too has concentrated on machine design. His prior experience was in the machine design field for Baldwin Locomotive and as a draftsman for Westinghouse.

Tom Karanzalis, another Drexel engineer, came to us in 1948 from a sales engineering position. He advanced through the Parts Service Department to become assistant to the Parts Manager. Then, in 1953, he became liaison man between Engineering and Production. He was made Administrative Engineer in 1956. Now Tom is responsible for all engineering records, blueprints and clerical work having to do with the Engineering Department.

The Sales Engineers

Working steadily with a development team like this are the Langston sales engineers. Again, in this phase of Langston service, there is a record of extraordinary achievement—and extraordinary service to the customer in the paper-making industry. The sales engineers work closely with paper mill management and engineers, keeping step with plant problems and telling the story of what the newest equipment can do and how it can be operated most effectively and efficiently.

an outside erector and in 1931 a sales engineer.

Experienced foremost with winders in the board field, he has also helped engineer many smaller winders for fine papers. His winder sales work has taken him into leading mills in every part of the country and Canada.

Mechanical Background

Dick Littleton is a mechanical engineer who got his basic training at Drexel and then did postgraduate work



CHIEF ENGINEER Henry W. Moser, second from left, with assistant chief engineers Jim Ferara, left, and Bill Emerson, second from right, and Jack Paterson, assistant to the chief engineer.

Working under Ed Seeger's direction, out of the Camden, N.J., headquarters, are Harry Goldberg, Alvin C. McCully and H. R. (Dick) Littleton. This is a seasoned team which adds immeasurably to the depth and variety of experience available to the Langston paper-making customers.

Harry Goldberg in December will have been with Langston 45 years. He first went to work for the company as an erector in 1912 and after thoroughgoing experience in building winders and other Langston machines became

in electrical engineering at the University of Pittsburgh. Before joining Langston four years ago, Dick was an instructor in the Air Force and later a sales engineer for the Westinghouse Company.

Al McCully came to the company as a sales assistant in 1956. Also a mechanical engineer, Al had previously worked on pneumatic control systems for the Conoflow Corporation, Philadelphia, and in the expansion and development department of the Atlantic City, N.J., Electric Company.



Harry Goldberg



Al McCully



Dick Littleton



Fred Leser



Bob Schultek



Bob Carpenter

Chicago Sales Office

The Chicago sales office, under Walter Goettsch's direction, is manned by Fred A. Leser, Jr., and Robert V. Schultek.

Fred Leser, with Langston for seven years, brought with him five years of background experience with Westinghouse and three years as an officer in the Army Signal Corps. He got his degree at Pennsylvania State University and is a member of TAPPI.

Bob Schultek is a graduate of Drexel Institute. An electrical engineer, he formerly was employed in engineering capacities in the manufacture of switch-gear equipment and automation controls.

West Coast Representative

Bob Carpenter holds down the fort on the West Coast. Carpenter came with the company in 1955 and recently was transferred from the Chicago office to the San Francisco area, as our West Coast representative.

Carpenter is a graduate marine engineer. He broadened his education by doing engineering work in the manufacture of bottling machinery. At Langston, he underwent, as do our other sales engineers, intense indoctrination in customer requirements, services and equipment.

A major role in service, once the sales engineers size up the picture, is played by a staff of inside sales assistants, an outside erection force and the parts department. These are under the direction of Cliff Mayhew.

Customer Relations

On Cliff's customer service team are sales assistants Carson D. Cash, Robert M. Weisbrod, Robert G. Constantine and William H. Kennedy. Also working with Cliff are Chief Service Supervisor William E. Schroeder and assistant supervisors William F. Ross and George Crispin, Jr. There is a crew of 23 outside erectors. And a parts department under Manager Henry Fischer and his assistants, Granville (Granny) Strachan, Les Selah and Ted Zulko.

Bill Schroeder, who directs Langston's world traveling crew of field erectors, started with the Company in 1928 and steadily assumed increasing responsibilities over the years. In keeping with the Langston tradition of hiring members of the same family, Bill has a son, Bill, Jr., on the erector staff and a brother, Martin, working as an inside erector. Bill was preceded as field erector chief by another brother, now deceased.

While lending his years of experience to aid his crew in solving operating and installation problems, Bill supervises



SALES ASSISTANTS, left to right, are Carson Cash, Bob Constantine, Bob Weisbrod and Bill Kennedy.



PARTS DEPARTMENT MANAGER Henry L. Fischer, seated, discusses parts drawing with assistants, left to right, Les Selah, Granville (Granny) Strachan and Ted Zulko.

the selection and training of new erectors. In addition, he conducts for customers classes in maintenance, operation and production—a service looking toward getting the most effective machinery performance.

William Ross, one of Bill's two knowledgeable assistants, has been with Langston for 23 years, shares in supervisory duties and acts as trouble shooter in clearing up special problems that may arise in the field.

George Crispin, the other assistant, also plunges into service problems and lends a hand in conducting the classes for customers. Crispin has been with Langston for 12 years; his father, George Crispin, Sr., for 30 years.

Parts Department Busy One

Henry Fischer, as parts department manager, is responsible for filling 600 to 700 orders a month. It's a department that is called on in times of emergency and sometimes must supply parts in a matter of hours.

Henry has been a Langston man for 35 years, a span of which he took full advantage to acquire an intimate knowledge of equipment. As a result, he can suggest temporary expedients to keep a plant operation going while ordered parts are being rushed through production.

The Financial Side

Another member of the Langston team thoroughly steeped in the engineering tradition but additionally trained in financial affairs is **George E. Brown**, the company treasurer.

Perhaps best known to customers through correspondence and telephone contact, George is mainly concerned with helping clear the financial end of equipment purchases.

He is a 1932 civil engineering graduate of Lafayette College. Later he studied accounting, earning certification as a Public Accountant. He was with United Aircraft and the Boonton Radio Corporation before he came to Langston. Brown heads a department of 25.



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REVOLUTIONARY . . . NEW . . . A PENNSALT EXCLUSIVE



Outlet connection

PENNSALT'S NEW BULK SODIUM CHLORATE CAR

This special bulk car was developed by Pennsalt Technical Engineers for the greater convenience and economy of Sodium Chlorate users.

- **FAST, SIMPLE, AND COMPLETE UNLOADING.** Water or re-circulating solution is introduced into a vertical jet pipe mounted directly over the 4" discharge outlet. Part of the stream jets directly into outlet pipe keeping it from clogging, and the remainder issues through a side outlet which, when rotated, undercuts and dissolves chlorate. Car floor sloping to outlet provides fast chlorate removal and car drainage.
- **MAXIMUM ACCESSIBILITY.** Flat top of car allows safe walking. Eight large hatches provide easy access and inspection of interior, and allows maximum visibility into the two large compartments.
- **REQUIRES LESS ATTENTION.** Eliminates awkward handling of hose necessary for conventional tank cars. Eliminates crystal hang-up at car ends.
- **CORROSION-RESISTANT.** Purity of product is assured by corrosion-resistant lining.

. . . Unloads Completely

This new bulk car is another example of Pennsalt's constant effort to aid pulp mills in the handling of chemicals. Think of its Technical Service Engineers as being "on your staff but not on your payroll." They are available for advice on all problems involving transportation, handling, storing and use of Pennsalt Industrial Chemicals.

From strategically located plants and offices Pennsalt provides fast and dependable deliveries.

**PENNSALT OF WASHINGTON DIVISION
PENNSALT CHEMICALS CORPORATION**
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OFFICES AND PLANTS:

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New Trona tank car fleet speeds sodium chlorate service

Custom-built for American Potash & Chemical Corporation, a new and thoroughly modern fleet of tank cars is being added to better serve Sodium Chlorate users from coast-to-coast.

Designed to carry bulk NaClO_3 , the cars are being equipped with a specially engineered system for unloading that saves both manpower *and* hours. A protective lining maintains product purity. The new design also stresses easy accessibility, increased safety and convenience.

*Watch for these new tank cars—reflecting the quality
of Trona chemicals and service—modern to the minute.*

American Potash & Chemical Corporation

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*Third
Unit
now on
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B&W High Pressure, High Temperature Boilers for International Paper

**Two Recovery Two Power Units Now on Stream
at Pine Bluff, Arkansas Mill**

This is International Paper Company's new bleached board and newsprint mill near Pine Bluff, Arkansas. The 60,000 kw power demand, process steam requirements, plus rising fuel costs prompted the selection of high pressure, high temperature steam generating equipment.

Four B&W Boilers—two power and two recovery units—supply steam at the rate of 1,300,000 pounds per hour. The Cyclone Furnace fired power boilers burn bark, oil, coal, or natural gas alone or in combination. Each generates 450,000 pounds of steam per hour at 1275 psi and 1000 F. The recovery units are designed to process 1,170,000 pounds of black liquor solids per day and produce 202,000 pounds

of steam per hour at 1275 psi and 900 F. For efficient heat recovery, they're equipped with economizers, tubular air heaters, and Venturi Evaporator-Scrubbers which reduce exit gas temperatures to 200 F.

Pine Bluff's steam generating system is another example of B&W's ability to meet the rapidly increasing steam demands of the Pulp and Paper Industry. If you're thinking of building a new mill or expanding an old one, we can provide the economical solution to your steam generation and chemical recovery problems. Just write to the Babcock & Wilcox Company, Boiler Division, Barberton, Ohio.



B&W

THE BABCOCK & WILCOX COMPANY

BOILER DIVISION

P-823



PULP

PAPER

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in 60 cities in the United States,
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Africa, and Asia.

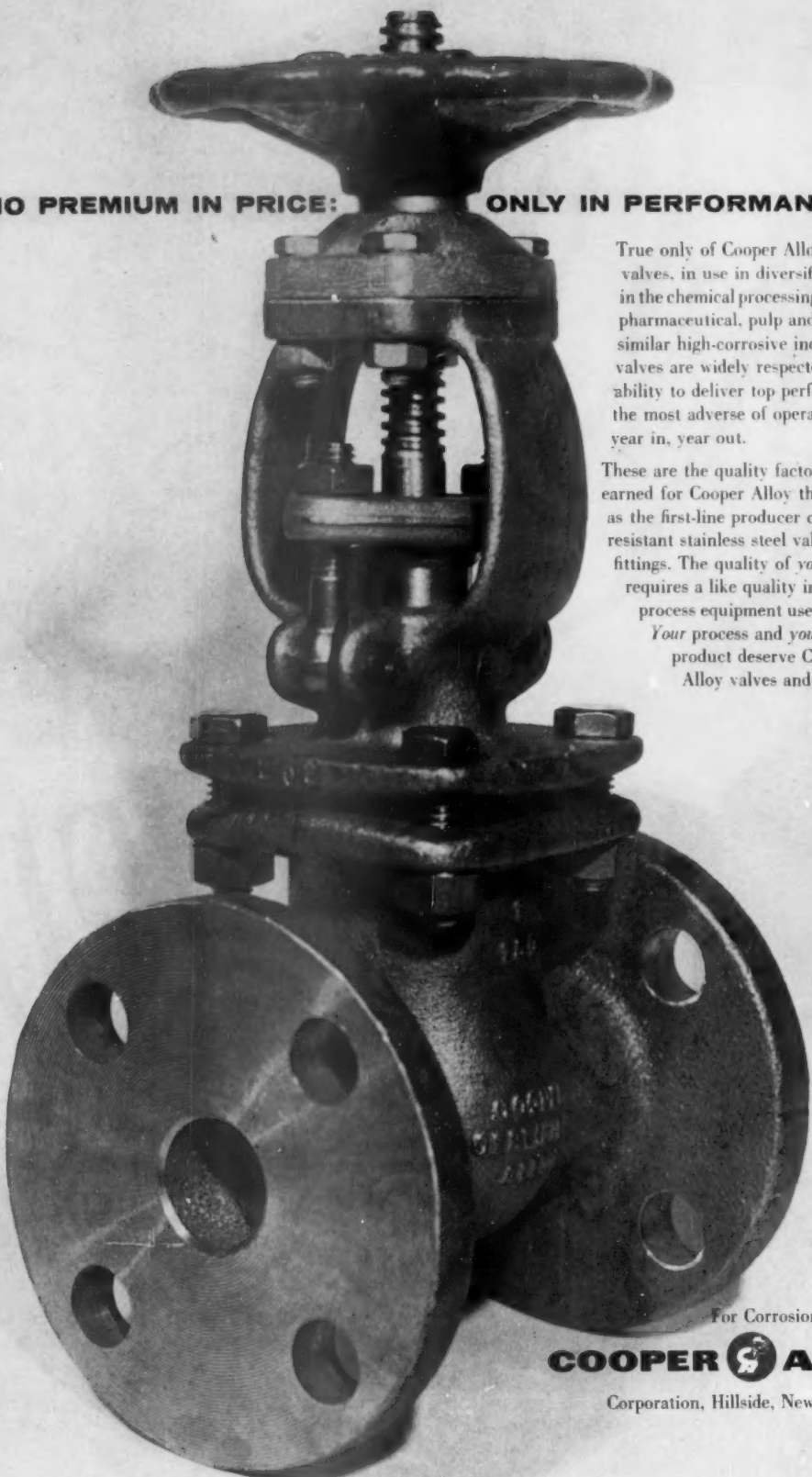


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In New England—CARTER RICE STORES & BEMENT



NO PREMIUM IN PRICE:

ONLY IN PERFORMANCE!

True only of Cooper Alloy stainless valves, in use in diversified applications in the chemical processing, petrochemical, pharmaceutical, pulp and paper, and similar high-corrosive industries. These valves are widely respected for their ability to deliver top performance under the most adverse of operating conditions, year in, year out.

These are the quality factors which have earned for Cooper Alloy the reputation as the first-line producer of corrosion-resistant stainless steel valves and fittings. The quality of *your* product requires a like quality in the process equipment used to make it. *Your* process and *your* product deserve Cooper Alloy valves and fittings.

For Corrosion Control

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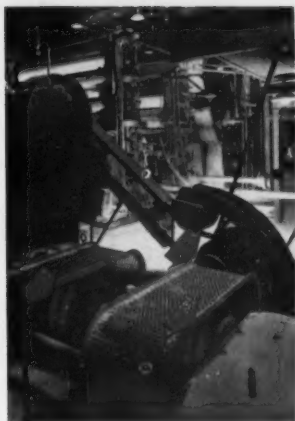
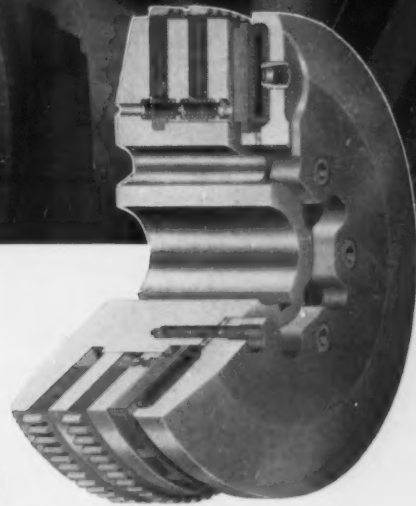
Stainless steel valves, fittings, castings; Plastic pumps, valves, fittings



WICHITA CLUTCH PROVES DEPENDABLE

ON MAIN WET END DRIVE

The Wichita Clutch eliminates slippage at this vital point.



**Wichita Clutches also chosen
by Fleming & Sons, Inc.
to lower maintenance
on this calendar drive . . .
arrows point to cutter drive clutches**

Fleming & Sons, Inc., paper manufacturers in Dallas, Texas, have installed several Wichita Clutches and Brakes as a part of an intensive modernization program to reduce maintenance costs. The Wichita equipment is proving dependable according to plant engineer, Walter Alderfer.

If you are having a clutching or braking problem, it will pay you to call in a Wichita Engineer to work out a profitable solution.

Contact your nearest Wichita Engineer today!

Clutch & Control Engineering Co., Livonia, Mich.
L. H. Fremont, Cincinnati, Ohio
W. G. Kerr Company, Pittsburgh, Pa.
Smith-Keser & Co., Avon, Conn.
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Frank W. Yarline Co., Chicago, Illinois
Larry W. McDowell, Long Beach, California
Andrew T. Lobel, Denver, Colorado

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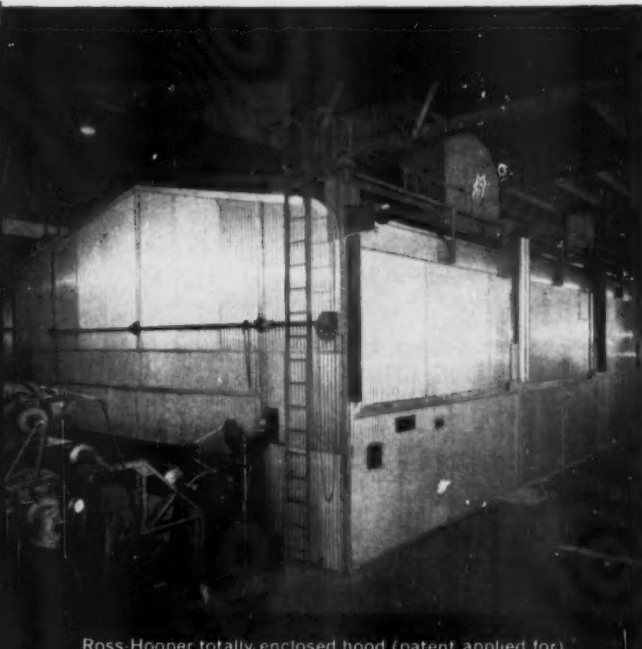
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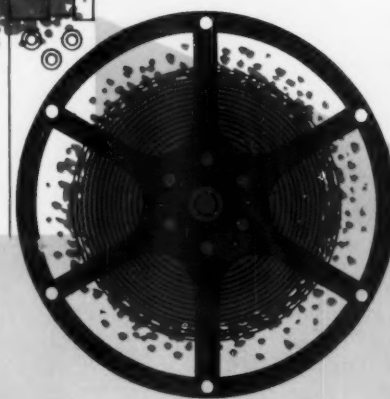
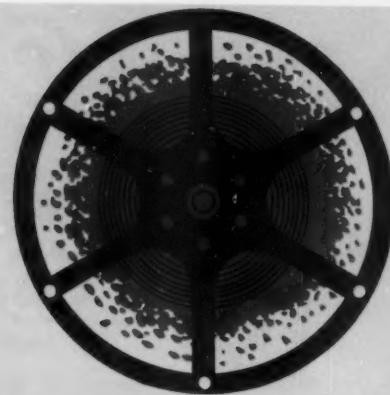


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- ① Portion of general administrative offices at Huyck Felt Company's Aliceville, Alabama plant.
- ② Batteries of modern feltmaking looms capable of weaving the widest felts in use today.
- ③ Skilled operators joining woven fabric into endless belts.
- ④ Burling room showing spacious, well-lighted work areas where felts are painstakingly checked before finishing.
- ⑤ Several of the large instrument-controlled rotary fulling mills used to give felts proper size and body.
- ⑥ Five of the automatically operated stainless steel washers employed to insure cleanliness and apply chemical treatments.
- ⑦ View of the drying room where felts are dried under tension to insure proper size for installation and start-up.

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INTERNATIONAL BONDING SYMPOSIUM IN APPLETON

Probes Way to Higher Speed...

on paper machines, and advances industry versatility. Work in England reveals knowledge of breaks. New techniques developed.

By ALBERT W. WILSON
Editor, Pulp & Paper

Appleton, Wis.

● The old days when only an inconspicuous small coterie of scientists would attend a fundamental research symposium in this industry are over. It is evident the industry now recognizes the importance of these meetings—from them come the information and techniques which will fundamentally change future pulping and papermaking processes.

There were 235 scientists at the symposium on fiber attraction and bonding at The Institute of Paper Chemistry, including a sizable group from Europe and New Zealand. It seems only yesterday that the highly functional and modern auditorium was built at this Institute, American industry's own research center and graduate school, but already it is too small for such meetings. This may be the last to be held here. Like other technical meetings, large city hotels may be required for future gatherings.

This was the last international meeting on fiber bonding to be held until 1961. In September of that year, the widely heralded symposium at Oxford University, England, will draw industry scientists from all over the world. That meeting promises to be bigger than the one at England's Cambridge University in 1958, which industry scientists still talk about as having advanced thinking in this field by giant strides.

Several papers given here were genuinely new. Others pulled together scattered works and little known data. This material in future years will pave the way to breaking machine speed barriers in papermaking, solving secrets of formation, etc. A better

understanding of fiber bonding and advancement in technology and versatility of the industry were achievements here. Philip E. Nethercut, secretary-treasurer of the sponsoring TAPPI organization, called this meeting "the best technical program I ever heard."

Principles of Adhesion

An outstanding new work by G. O'Blenes and Bronislaw Radvan, of the Beaconsfield, England, research laboratories of the Wiggins Teape Group of specialty paper mills, was presented by Polish-born "Ben" Radvan. Developing principles of web adhesion on the paper machine, this paper may influence future machine speeds. The

existence of regions of instability with respect to breaks was demonstrated at Beaconsfield and later confirmed on paper machines. The investigators used apparatus for measuring adhesion of wet web to solid surfaces and simulating breaks in an open draw. There were implications for the design of future machines.

Dr. Olle Andersson, from the Swedish Forest Products Research Institute, in commenting on the Wiggins Teape work, referred to work in Sweden two years ago in which paper wet webs were adhered to rubber, granite and steel. (Incidentally, Dr. Andersson, who is PULP & PAPER INTERNATIONAL's editor in Sweden, indicated how importantly Europe regarded these sessions in Appleton



Marton



Radvan



Campbell



Van den Akker

From Hungary—Poland—Canada—U.S.A.—Participants in Symposium

DR. RENATA MARTON, now with N.Y. State College of Forestry, Syracuse, N.Y. (U.S.A.), was research supervisor at the Paper Industry Research Institute in Budapest, Hungary, and before that she studied in Krakow, Poland, and the Sorbonne in Paris. She also was in research in Vienna. Her color slides on paper bonding were outstanding.

BRONISLAW "BEN" RADVAN, who moved to England from Poland in 1943, is research associate at Wiggins Teape's research center in Beaconsfield, England, and presented a paper on new work being done there on web adhesion on the machine.

W. BOYD CAMPBELL, consultant of Montreal, Canada, reviewed some of his work and presented his theories on the mechanism of bonding.

DR. JOHANNES A. VAN DEN AKKER, who hails from Los Angeles, and is now one of research leaders in the Institute, brought together a great deal of important information on structural aspects of bonding.

Bonding Symposium: wet web strength . . . fiber adhesion

by making a 5-day round trip by air just to attend them.)

Dr. Johannes Van den Akker of the Institute brought together much significant information on structural aspects of bonding. He emphasized the probable physical nature of fiber-fiber bond. He said a number of factors, some intrinsic to the fiber-liquid system (e.g., wet flexibility of fibers) and some environmental, govern creation of fiber-fiber bonds.

In principle, one can be sure that regular arrays of cellulose chains do not cross link in simple patterns; the geometry of the contiguous fibers governs the number and area of the regions of molecular bonding, in a fiber-fiber bond, and, hence, also governs the 'intrinsic strength' of the bond," he said. "Two cases of bonding may exist, and in either case the Campbell effect promotes the intimate approach of molecular groups needed for molecular bonds to become established. The thickness of bonds, which relates importantly to relative fiber-fiber movement during stressing and straining of the bonds, is extremely thin. Accordingly, the relative movement of bonded fibers during pre-rupture shear straining is negligible in comparison with the strain response of paper resulting from the instantaneous and creep strain of the fibers themselves."

Dr. Alfred H. Nissan, formerly with Bowaters Paper Corp. in England, later at Leeds University, England, now chief professor at Rensselaer Polytechnic Institute, U.S.A., discussed fundamentals of adhesion from molecular forces. He said forces holding a sheet together must be attributed to attractive energies between atoms. For polymers these contain

homopolar, hydrogen and Van der Waals bonds, the hydrogen bonds contributing most to cohesion. A model of cellulose sheets was postulated as consisting of nonyielding rodlets in a homogeneous hydrogen-bond controlled amorphous region which takes the strain energy. An approximate law of strength, was built around a concept that a chain is as strong as its weakest link, and the larger the number of links, the weaker will be the weakest one. Long chains, paradoxically, he said, will require higher rupture energy than short chains. Further study made it possible to estimate the Van der Waals as well as hydrogen-bond contributions to rupture energy.

Wet Web Strength

A paper prepared by Prof.-Dr.-Ing. Walter Brecht, head of the Institute of Paper Technology at Darmstadt, Germany, since 1931, and one of his young men, Dr. Horst Erfurt, described a great mass of information developed with use of a new testing device which determines the stress-strain properties of paper in range of 13% to 90% solids. Mirrors and a light source are used. There is a mirror for load measurement and one for elongation measurement.

Dr. Erfurt, who had received his doctorate only a few weeks earlier, and who has migrated to America and will work at Hammermill Paper Co. as research engineer, gave this paper. It was a thorough report on factors affecting breaking loads on paper from freshly ranging formed to bone dry.

The breaking load at any dry content is improved by fiber swelling, as it depends on the nature of the pulp,

the beating and the drying. The breaking elongation, generally decreasing with increasing dry content, is chiefly determined by the extent of fiber curling which develops with growing shrinkage.

Special attention was paid to the role of form components of groundwood and chemical pulps. The law which controls the breaking load of mixtures composed of long fibers and fines, valid for wet webs as well as for dry papers, seems to be based upon three factors. They are the breaking load of each component, the ratio of long fibers to fines and the apparent density of each component. The elongation is dependent on the fiber coiling only and not on fiber length.

The studies showed that wet web strength is determined up to about 35 to 40% b.d. by interfiber friction, which means by all conditions which bring about the number of contact points between the individual fibers. Till about 20% b.d., the surface tension improves noticeable wet web strength by pulling the fibers together. Above 40% b. d., the free water is removed and the water of swelling begins to evaporate. From that point interfiber bonds occur and surpass the effect produced by interfiber friction more and more.

A paper from the Pulp and Paper Research Institute of Canada was well received, and it revealed that this industry is learning more about wet webs. Given by A. A. Robertson, it detailed experiments which showed graphically the changes in sheet properties (tensile strength, stretch and caliper) as wet webs are progressively dried within the range of 10 to 50% solids content.

The curves for a variety of pulps have a characteristic shape but are displaced relative to the percent solids axis depending on the amount of water associated with fibers. The data are such that a critical solids content may be determined which marks the disappearance of "free" water from the web. The "associated" water is appropriately measured by the hydrodynamic specific volume as determined by the permeability method.

The properties of the associated water and the mechanisms of fiber-water association are discussed by reference to a variety of experimental methods based on drying rate, dye mobility and water retention under hydrostatic tension. Each of these methods measures a portion of the associated water, the quantity being



Lagerstrom

Andersson

Pettersson

Three Swedes in a Reunion at Appleton

GOSTA LAGERSTROM, research chemist with Columbia Southern Chemical Corp. at Barten, Ohio, U.S.A., graduated from the Royal Institute in Stockholm in 1956. The other two are residents of Sweden. DR. OLLE ANDERSSON, assistant to the director of paper technology, Swedish Forest Products Research Laboratory, is also editor in Sweden for PULP & PAPER INTERNATIONAL. SUNE PETTERSSON is head of the Paper Division Research for Billeruds, A.B., Saffle, Sweden.

determined by the firmness with which water is held by the fiber and the forces of water removal which are characteristic of each method. A comparison of the methods provides a distinction between mobile and immobile water and a means of measuring them.

Fiber Properties and Adhesion

A pioneering study on a brand new technique as it relates to fiber flexibility was offered by The Institute of Paper Chemistry's S. F. Kurath. Using an electromagnetic transducer, this may pave the way to new knowledge of mechanical behavior and properties. The Institute has investigated in great detail the mechanical properties of wet pads of a Southern pine (U.S.A.) bleached kraft pulp and also the real and imaginary components of the complex shear modulus as well as normal stress necessary to compact a pulp pad.

Compression was found to have no effect on the frequency dependence of the complex shear modulus or the mechanical loss tangent. The general frequency dependence of the complex shear modulus is given in the 6 to 1000 c.p.s. frequency range. The possibility of reducing mechanical data to a common internal pad geometry was discussed as a means of comparing mechanical properties of wet pulps. A reference complex shear modulus, G_o^* , is obtained which is directly related to the flexibility of individual fibers and is a measure of this important quantity.

Two methods of dimensionally stabilizing paper (work done at the U.S. Forest Products Research Laboratory) were reported by Dr. Wilby E. Cohen, senior principal research officer, Division of Forest Products, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia, with E. J. Stamm and D. J. Fahey of the U.S. Laboratory. Mr. Fahey presented the report. (Incidentally, Dr. Cohen is PULP & PAPER INTERNATIONAL's editor in Australia).

Embrittlement limits these methods.

Heat Treatment Method, with or without Catalysts—the reaction being independent of their nature and the kind of furnish. Whereas heat is essential to activate the reaction, catalysts serve to accelerate it when once started, and thus to reduce the time or temperature necessary to attain the desired level of dimensional stability. Values of approximately 60% have been attained in experiments. Reaction rate is also dependent on the treatment temperature. The use of

Drying—"Costliest Single Item in Mill"

... and yet, it is one of the least known. So says Prof. Alfred H. Nissan of Rensselaer Polytechnic Institute, U.S.A., formerly of Bowaters and Leeds University in England, who did double duty by serving on the research symposium at The Institute of Paper Chemistry, and also as featured speaker at a packed Lake States TAPPI section dinner, presided over by Robert L. Leaf, Jr., vice pres. and prod. mgr., Shawano Paper Mills.

Dr. Nissan divided the drying problem into three parts: 1, physics, 2, mathematics, and 3, practical. After calling it papermaking's "most expensive" operation, he said:

"Yet relatively few have really studied drying, though the art of drying is older than the discovery of fire. Paper has been dried for 2,000 years and on cylinders for 110 years. But despite this history, we know less of the physics of drying and the mathematics of what takes place than we do of the practical side (design, etc)."

He told of research progress achieved by using a wind tunnel and pseudo-wet lamp bulb at Leeds in England and at Rensselaer.



DR. WILBY E. COHEN, senior principal research officer, Division of Forest Products, C.S.I.R.O., Melbourne, Australia, was on leave in U.S.A. when he collaborated with Americans at government laboratory in developing methods of dimensionally stabilizing paper.

higher temperatures can wholly or partly obviate the need for catalysts.

Embrittlement is a necessary evil of dimensional stabilization and is most serious with the most effective catalysts, because these are, by nature, slightly acidic and the pH of the impregnated paper is accordingly low. Conversely, wet strength is enhanced by dimensional stabilization.

Embrittlement of the dry paper becomes excessive when the degree of stabilization exceeds 40%. Hence, it may be necessary to compromise on this level and/or to adopt some protective measures. The best protection so far investigated has been to use a mildly alkaline catalyst, such as 0.1% sodium hydroxide. Thus, attaining up to 50% dimensional stabilization with restricted embrittlement and enhanced wet strength is possible.

Cross Linking with Formaldehyde Method—a much faster method. The rate of reaction is independent of the reactant concentration above 100 milligrams per liter and within the limits of concentration tested. It is dependent on the nature and concentration of the catalyst whether this be acid

vapor or solid salt. It is also dependent on temperature and initially proceeds linearly with the square root of time. The reaction is independent of the nature and origin of the pulp furnishing the paper. Reactant and catalyst may be applied in either vapor or liquid phases.

Embrittlement and wet strength development, being artefacts of the cross-linking reaction, are not directly dependent on the nature and concentration of the catalyst so long as the concentration is confined within certain limits. Above these limits, embrittlement is intensified and wet strength development is retarded. Embrittlement may be restricted by selecting treating conditions that prevent dimensional stabilization from exceeding approximately 40%.

A formaldehyde cross-linking treatment gives much higher wet strength properties than a catalyzed heat treatment for a comparable degree of stabilization but otherwise the heat treatment with small amounts of alkali as catalyst appears to be more favorable.

Use of colors in illustrations showing changes in individual fiber structures and geometry of high yield pulps brought about by delignification and refining and their possible effects on paper properties was the feature of an unusual presentation by Dr. Renata Marton, now assistant professor of research at New York State University College of Forestry. She was former research supervisor in the Paper Industry Institute at Budapest, Hungary, and did work on cellulose and paper at Krakow, Poland, the Sorbonne in Paris and Vienna University.

Her report presented an important aspect of adhesion of fibers which had been looked at only casually for many years. This is an aspect relating to fiber geometry which

Bonding Symposium: development of bonds . . . additives

should be examined carefully and critically.

The opportunity to initiate this study arose when white birch semi-chemical pulps were prepared for a rheological study. Portions of pulps produced by a cold soda technique were delignified by sodium chlorite from the original 19% to levels of 12 and 2.3%. Handsheets were prepared from pulps at these three lignin contents under varying degrees of ball milling and wet pressing.

The resulting fibers were examined with the aid of light and polarizing microscopes, and swelling techniques were employed for studying the changes of the fiber surface and fiber wall. Extent of removal of the primary wall and outer layers of the secondary wall were measured in order to assess the potential active fiber surface. The portion of this surface utilized in bonding was assessed from cross-sections of the corresponding paper specimens. Changes in the cross-sectional contours of the fiber were observed for the different treatments imparted.

After Dr. Marton's paper, Dr. Olle Andersson of Stockholm showed a motion picture depicting new Swedish methods of observing adhesion forces when dilution in water is high. Two rotating prisms are the main features of this new method of scanning fiber attraction. A lamp shows through a sample cell to the prisms and a scanning slit and electron multiplier are used.

Development of Bonds

On the mechanism of bonding, Dr. Boyd Campbell of Montreal, a consultant, reviewed much of his work and his theories.

Three factors are involved in cellulose bonding—available area, contact and hydrogen bonding, he said. The primary form of cellulose is elementary fibrils with about 100 molecules cross-section and about 400 sq. meters area per gram. Because of internal bonding, only a small part of this area is available. Consideration of various possibilities indicates that exterior surface of fibers, which varies from 1.0 to 2.3 sq. meters per gram depending on the degree of beating, is the main source of usable area.

Wet pressing, much more intense than average pressure applied, is first factor in securing contact and is much assisted by softening due to internal fibrillation by beating, according to Dr. Campbell. More intimate contact is brought about by liquid internal

tension on drying.

Final hydrogen bonding differs from crystallizing force in that there is no need for parallel orientation in the fibers to be bonded but does require close contact. Tension during drying will diminish the bonding between surfaces at right angles to the tension, he concluded.

John Swanson, senior research associate at The Institute, presented a new work done by A. Steber, with a new measurement of bonded area on a sheet by use of Krypton rare gas of the argon neon family, a "noble" and not reactive gas.

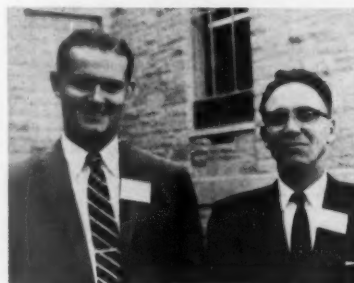
The linear correlation between the specific scattering coefficient and the B.E.T. nitrogen adsorption surface area has been validated for three

widely different pulps—Weyerhaeuser coniferous bleached sulfite, MacMillan & Bloedel Douglas fir-hemlock unbleached kraft, and Coosa River bleached sulfate gum pulp.

His paper was a further progress report on factors contributing to strength of paper. The bonded area may be the principal factor in establishing firmly, data indicate that tensile strength is directly proportional to the bonded area when the degree of beating is varied and wet pressure is held constant.

A DuPont scientist, R. A. A. Hentschel, then discussed synthetic fibers. He concluded that tensile strength rises as the fiber length increases, reaching a maximum value characteristic of the fiber used. Tear strength increases essentially linearly in the

From Far and Wide They Came to Appleton



Reichel

Walters

FRANK H. REICHEL JR., research director for Ketchikan Pulp Co., Ketchikan, Alaska, and LYNWOOD A. WALTERS, research director for National Vulcanized Fibre, Wilmington, Del., U.S.A.



Beazley

Hossain

WARREN BEAZLEY, manager of pulp pilot plants and pulp development, Industrial Cellulose Research Ltd., Hawkesbury, Ont., Canada, and S. HOSSAIN, who moved to Canada from his native India a few years ago and is in pioneering research with Abitibi Power & Paper Ltd., Toronto, Ont.



Whitney



Swanson

DR. ROY WHITNEY, dean of The Institute of Paper Chemistry, and JOHN W. SWANSON, senior research associate and head of physical chemistry group at The Institute, were the co-chairman of the TAPPI-sponsored international symposium on the fundamentals of fiber attraction and bonding. Dr. Whitney came to the Institute from Maine; Mr. Swanson from Iowa.



Olson

Williams

Vroom

ROBERT OLSON, process engineer, Wood Conversion Co., Cloquet, Minn., U.S.A., chats with H. M. GORDON WILLIAMS, who came from Laverstoke Mills, Portals Ltd., "Papermakers to the Bank of England," a world famed currency paper maker of Whitchurch, Hants., England. ALAN H. VROOM, director of research for Consolidated Paper Corp., Grand Mere, Que., Canada.

length region studied as the length increases, with the highest level of tear strength being associated with the largest fiber diameter. Tensile and tear strengths also rise to a constant level as the basic weight of the sheet is increased. Again the basis weight at which maximum strength is reached is dependent on fiber diameter. Paper tensile strength is shown to be linearly related to fiber tensile strength.

Role of Additives

A. E. Staley Mfg. Co.'s M. L. Cushing and K. R. Schuman reported that the deliberate addition of polysaccharides in the wet-end of papermaking processes is a practice of long standing. Various additives have been used to improve such sheet qualities as burst, tensile, fold, internal bond, pick resistance, porosity, and many others. The additives used include starches, cellulosic and hemicellulosic materials, natural gums such as locust bean, guar, karaya, etc. The degree of retention is different for several types of corn starch additives. The gains in sheet strength do not always parallel the amount of starch retained.

An attempt was made to determine the relative rate of sorption of a series of additives by varying the time of contact in the sheet mold from 5 to 120 seconds. Additives studied included unmodified corn, thick boiling corn, hydroxyethyl native corn, guar

gum, guar gum-thick boiling corn, combination, carboxyethyl starch, carbamoyl ether starch and a cationic beta (dialkyl amino) ethyl ether of starch.

These studies confirm theories that the rate of sorption and degree of retention of polysaccharide additives depend upon the molecular weight and structure of the additive.

Large gaps in knowledge of rate-controlling mechanisms in uptake of natural and synthetic resins—such as wet-strength—on cellulose fibers, were cited by Dr. Edward F. Thode, new head of the Institute's pulping and papermaking section. This is of great importance to better understanding and control of stock preparation.

Stock preparation reactions are heterogeneous and thus must involve several of five classic steps: Transport of the reactants from the bulk fluid phase to the interface, adsorption of reactants, at the cellulose-fluid interface, reaction at the "cellulose surface," desorption of by-product (if any) outward diffusion of by-product (if any). Experimental results of various workers were analyzed within such framework.

Strength and resilience of polymer-impregnated paper was reported by P. J. McLaughlin, research chemist, Paper Application Laboratory, Rohm & Haas Co.

"The results of this study strongly indicate that for paper saturated with moderate levels of polymers, the fiber-fiber bonds, largely undisturbed by saturation, play a dominant role in determining tensile strength, modulus, and resilience," he said. "The softer polymers deposited around these bonds, lower the initial modulus by permitting easier fiber-slippage. Harder saturants (shear modulus about 2000 kg. per sq. cm. at 20°C.) do not cause a reduction in initial modulus. All but the softest polymers reinforce the fiber-fiber bonds by contributing extensibility and facilitating rearrangement of the fiber network during deformation, with consequent strengthening.

"The fiber network also appears to be the principal contributor to saturated paper resilience," continued Mr. McLaughlin. "At least with the softer saturants resilience is lowered. Some improvement is observed when adhesion to fiber is reduced by (a) removal of adhesive functional groups, or (b) reduction of molecular weight.

"Behavior of saturated paper would be expected to be markedly different at higher levels of polymer incorporation (ca. 100% on fiber) where the concentration of fiber-bonds would be greatly reduced," he concluded. Greater extensibility and lower strength would be expected with the softer saturants since these rather than the fiber network would be bearing most of the load."

Research Will Keep Growing

Most highly socialized segment of U.S. economy, its future will be influenced by socio-economic pressures, the ethic of conservation

By DR. JOHN G. STRANGE
President, The Institute of Paper
Chemistry, Appleton, Wis.

• This country is now spending over nine billion dollars annually on its various research endeavors. This is roughly ten times as much as we spent less than 20 years ago, and over 60% of our effort is financed directly or indirectly by government funds. Thus, if we may regard the many different research and development programs as a single enterprise, it is apparent that they represent the most rapidly growing and most highly socialized segment of our economy.

Now it is obvious that our intensi-

fied concern with research has been only partly stimulated by curiosity about ourselves and our environment, or by the humanitarian desire to alleviate poverty, disease and ignorance, or by commercial competition. Overriding all of these driving forces is the proposition of our national security and continuity at a time when they seem to be actively threatened by an antithetical and virulent political system.

There is no point in dwelling on this situation, important as it may be. I am quite sure that we will continue to flex our "scientific muscles" on an international scale for many years to come, but I am also confident that



DR. STRANGE, speaking before the International Fundamental Research Symposium delegates at luncheon in Appleton, Wisconsin, U.S.A., peers into future of scientific enterprise . . .

Bonding Symposium: Dr. Strange on future of research

when the political tensions are finally resolved there will be no sustained cutback in our collective scientific effort, although the emphasis will, of course, be shifted. My reason for feeling this way goes beyond the fact that science has become deeply embedded in our culture and that it tends to build on itself. The political pressures for discovery and invention will be more than replaced by social and economic pressures, and these pressures will, in turn, be fortified by a growing acceptance of the "ethic of conservation."

Socio-Economic Pressures

A great deal has been said and written about the tremendous surge in population which is taking place throughout the world. Only five years ago, at one of our Executives' Conferences, we tried to predict the size and character of the paper industry 25 years hence, or in 1975. It was necessary for us to postulate a national population for that future year, and after reviewing various demographic studies, we chose a figure of 200 million. It now appears that there will be at least 25 million more than that number, and there are some who make the seemingly fantastic prediction that our current world population will be doubled by the year 2,000, or within the lifetime of our children.

When one translates this arithmetic into raw material, space and energy requirements, he finds a tremendous and almost overwhelming challenge for science and technology. This, however, is merely the quantitative side. Of more immediate concern to us is the particular distribution of our population among various economic and social pursuits and the fact that we are well into an age of high mass consumption and are thus confronted with political, sociological, managerial and professional problems which have no historical precedent.

A year or so ago, for the first time, statistics disclosed that if we combine those who work in agriculture with those who are employed in manufacturing industries, the total is less than half of our (U.S.A.) working population! Or, putting it conversely, more than 50% of our working force is concerned with services of one kind or another. This figure becomes even more remarkable when one realizes that only 36% of our total population is at work. Of the balance, roughly 34 million are keeping house (or supposedly doing so); 19 million are of pre-school age; over 46 million are going to school, and around 14 million are retired. The astonishing fact is that



Von Streit

Arledter

Erfurt

Three Graduates of Germany's Darmstadt Institute in Reunion in U.S.A.

These three met at the Fundamental Research Symposium in U.S.A. (Appleton, Wis.), all being graduates in paper technology at the world famous Technische Hochschule Darmstadt, near Frankfurt/Main. Dipl.-Eng. ECKART VON STREIT graduated in 1955 and since 1958 has been with Great Northern Paper Co. in Maine (U.S.), where he is an engineer. DR. HANS F. ARLEDTER graduated in 1944, came to the U.S. in 1950 and is director of research for Hurlbut-Mead Paper Co. in Massachusetts. Newest arrival in U.S. is DR. HORST ERFURT, who has joined Hammermill Paper Co., Erie, Pennsylvania, after giving one of the papers at Appleton. He received his doctor's degree at Darmstadt a few months ago.

all our raw materials, food, clothing, and manufactured products are actually produced by only 18% of the people—and this on a 40-hour week!

This amazing division of labor and distribution of vocational pursuits is, of course, a direct reflection of our advances in science and technology. Certainly we are enjoying a greater abundance than any previous society, and we are doing so with proportionately less effort. Accompanying this abundance, however, have been some very puzzling problems of social organization, economic interpretation and individual orientation. Most obvious, and most frequently discussed, is the specialization of occupations and the highly sensitive interdependence of our population. The average person is more competent in certain ways than his ancestors, but he is also much less viable as an economic unit. The concept of the "rugged individual" has been undermined, and growing emphasis has accordingly been placed on welfare and security measures.

Less obvious than the tendency of the individual to seek collective security, but perhaps more alarming as both a present and longer range threat, is the fact that our division of labor, with its dwindling percentage of those who are engaged in manufacturing or agriculture, is forming an "economic geometry," if we may use that expression, which is increasingly sensitive to inflationary leverage. Pressures applied at a given point in the economy manifest themselves quite rapidly throughout the system and are not easily absorbed or accommodated by the majority of the population which is either performing

services, or is not a part of the working force.

Now there are, of course, certain countervailing forces to inflation, and one of the most important of these can be the continuing improvement of productivity, which we shall define at this point as "output per man-hour." I say that improved productivity *can* be a countervailing force because whether or not it actually is depends on wage-price movements within the area of the economy involved.

Quite frequently it is suggested that wages should not rise any faster than productivity, the implication being that if the two go forward at the same pace, it is probably all right. It seems to me that this is a very questionable and perhaps even dangerous thesis. It ignores many economic facts of life, such as, the interests of the consumer and the stockholder, our capacity to participate in world trade, and above all, the central point that technology and improved tools are the largest contributor to productivity, and they must be continuously refurbished by the re-investment of funds.

Ethic of Conservation

I should like now to deal briefly with the "ethic of conservation" and the influence which this concept may have on scientific enterprise.

At this point it is necessary for us to reconsider our earlier definition of "productivity." You will recall that we tentatively defined productivity as output per man-hour. Actually, productivity is a great deal more than this because, in its most meaningful sense, it involves nonproduction employees as well as those who are on the

production line, and more importantly, it also involves the efficiency with which we use our raw materials, energy and other resources, including capital funds. In short, productivity is the relation of total output to total input. When we define it in this fashion it becomes a measure of our effective use of both human and natural resources, and this, it seems to me, is the essence of dynamic conservation.

I use the adjective "dynamic" because in the minds of some people conservation is still a passive philosophy involving the saving or impounding of resources in order to protect them from human utilization. Carried to its extreme, this viewpoint is not only impractical, but it also suggests

a curious kind of dualism in which mankind is excluded from the so-called balance of nature. Now, it would appear that man is not only a part of the balance of nature, but he is also uniquely endowed with the capacity to improve and augment this balance, because he has the intelligence to probe its essential order and to understand its harmony. When this probing and understanding is undertaken with the ultimate objective of effective and conservative use, it becomes a matter of principle and thus has an ethical or moral basis which I would call "the ethic of conservation." It is my conviction that this concept will spread in the future, become one of the principal motivating factors among scientists.

One might wonder whether the "ethic of conservation" is compatible with an individualistic society which is spurred primarily by the profit motive, or whether, on the other hand, its effective pursuit requires a high degree of socialization. The answer, it seems to me, is quite clear. Governments and institutions may be guided by certain principles, but as Boris Pasternak has said, "Only individuals seek the truth." And it is through our eternal seeking of the truth that we build and expand our ethical and moral concepts. Self discipline and stewardship on a corporate scale would appear to be the answer, and I believe that we already see some rather good examples of this within our own industry.

As U.S.A. Industry Leaders See Finland

Helsinki . . . Nine top engineers and technical executives from the U.S.A. industry recently spent two weeks in Finland visiting over a dozen mills and they came to these conclusions:

1. A rapid rate of expansion in pulp and paper shows Finland is optimistic concerning rising worldwide demand.

2. The level of technological development is very high. Quality of pulp and paper products was impressive.

3. Finnish methods of storing pulpwood in water was interesting, especially as it helps to improve paper quality.

4. Methods of developing and utilizing heat was especially noted.

The group visited many mills including Enso-Gutzeit in Katka, A. Ahlström in Karhula, Myllykoski Paper Mill, Enso-Gutzeit in Summa, Joutseno-Pulp Co., Enso-Gutzeit in Kaukopää, Kymmene Co. in Kuusankoski and Voikka, Rosenlew in Pori, Rauma-Repola in Rauma, United Paper Mills in Valkeakoski, Serlachius in Mänttä, United Paper Mills in Kaipola, Tervakoski, and Tampella in Ingeröis.

The leader of the U.S.A. group, C. G. R. (Rusty) Johnson, vice-president and chief engineer of Kimberly-Clark Co., said they all were "very impressed by the level of technology and operating practices." He also said: "We were impressed by the optimism of the Finnish industry in providing capital for expanding so rapidly."

"At least for the time being there is no cheaper raw material for the paper industry in the U.S.A. than wood. Hardwoods, mostly birch, are being used more and more, as in Finland," said Mr. Johnson. "As to quality, the

Finnish paper industry is fully competitive on the U.S.A. market, and Finland is, after Canada, the greatest supplier of newsprint, although the quantity, considering the whole market, is not very big."

Asked if Finland could sell more newsprint to the U.S.A., the visitors replied:

"We are not economists, only technicians, and therefore we cannot reply to this question. Furthermore we, as representatives of our own companies, are your competitors. It is, however, certain that paper consump-

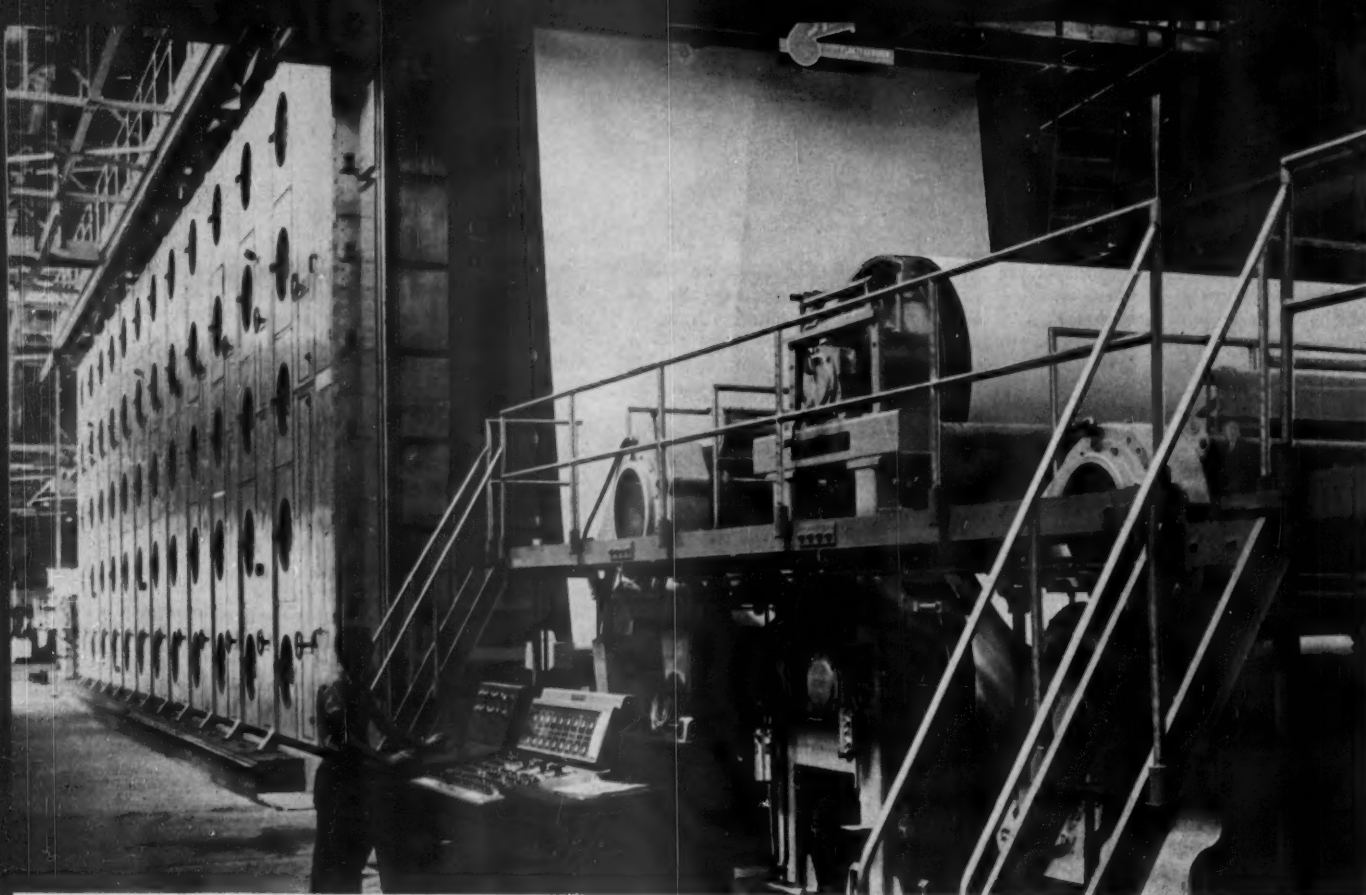
tion is increasing all over the world, and your sales will surely also increase with time. The U.S.A. consumption is estimated to reach about 230 kilos per capita within two or three years."

At a dinner at the Savoy Restaurant in Helsinki, the American group were guests of Holger Nysten, chairman of the board of directors of the Finnish Paper Mills' Assn. Speaker for this occasion was Dr. J. O. Soderhjelm, managing director of the Central Association of Finnish Woodworking Industries. Other guests included U.S.A. Ambassador to Finland John Hickerson, former Finnish Ambassador to the U.S. Rafael Seppala, and Holger Sumelius, managing director of the Finnish Paper Mills' Assn.



VISITORS TO FINNISH MILLS RELAX in an old fortress outside Helsinki. In recent years it has been restored and is used for social functions. A dinner was given there by the Finnish Paper Mills' Association in honor of the American guests.

Left to right around the table: NILS J. LINDBERG, Finnish Paper Mills' Assn., who is also editor in Finland for PULP & PAPER INTERNATIONAL; ERNEST H. VAISIERE, The Madden Corp., New York; DR. GEORGE SHEETS, The Mead Corp., Chillicothe, O.; MR. PELKONEN, Finnish Paper Mills' Assn.; EDGAR L. LAMB, vice president and chief engineer, Minnesota & Ontario Paper Co., Minneapolis, Minn.; C.G.R. (RUSTY) JOHNSON, vice president, Kimberly-Clark Corp., Neenah, Wis.; JOHN H. HEUER, vice president, Great Northern Paper Co., East Millinocket, Me.; HENRY FALES, vice president, St. Croix Paper Co., Woodland, Me.; MR. NYKANEN, Finnish Paper Mills' Assn.; DR. ROBERT MARICH, vice president, Coos Bay Pulp Corp., Scott Paper Co., Empire, Ore.; MR. LAKSO, Finnish Paper Mills' Assn.; RICHARD P. (TOM) PRICE, vice president, Hammill Paper Co., Erie, Penn.; and MR. PARONEN, Finnish Paper Mills' Assn.



FIRST FOR NORTH AMERICA IS THIS AIR BORNE FLAKT DRYER, designed to handle 400 tons a day at 150 psig. Actually it has dried more than that at only 60 psig. Its full capacity has not yet been reached.

Pulp Rides Air Cushion

in Bowaters pioneering pulp mill in South Carolina. In new type dryer, stock never touches conveyors or hot surfaces

By WILLIAM F. DIEHL JR.
Southern Editor, PULP & PAPER

● The most interesting aspect of the new Bowaters pulp mill at Catawba, S.C., U.S.A., is the new Flakt feltless pulp dryer—first of its kind in North America. First installations were in Sweden, built by the parent company Svenska Fläktfabriken of Stockholm. This Catawba unit was supplied by American SF Products Inc., New York. Utilizing a very high velocity stream of heated air to convey the pulp sheet through the machine, the dryer is clean, low on maintenance, and has a low capital investment cost, it is compact, requiring less room than most pulp dryers, and easy to install.

George Jackson, pulp mill superintendent, told this writer that the mach-

ine is rated to operate at 150 psig saturated steam. To date, the machine had operated on 60 lbs. and produces upwards of 500 tons of pulp, some 100 tons more than its designed capacity at less than half the steam.

Mr. Jackson said full capacity of the machine is unknown at this point and that it is highly possible it will go over the 600 tons a day mark at maximum steam pressure.

"This is a real joy to operate," he added, "because of the simplicity of maintenance." The dryer has 120 fans driven by 12 hp motors in the dryer housing. These fans may be removed without shutting down the machine. Drive and bearing supports for the drive rolls in the dryer are located outside the hot air zone, permitting quick and easy bearing changes.

How Pulp is Dried

This wet end machine is designed to handle bleached, semi-bleached and unbleached pulp. Bleached pulp is pumped from a 75 ton high density storage chest through a consistency regulator and Foxboro magnetic flowmeter into an 8,100 gpm SLH Buffalo fan pump which pumps dilute stock through a bank of 19 primary, three secondary and one tertiary Bauer Cleaners to a stainless steel header, from which it enters the sheet former.

The Sandy Hill sheet former is a vacuum cylinder, 11 ft. 6 in. in dia. and 192 in. trim. Four press rolls on the cylinder have pressures varying from 25 to 200 lbs. per lineal inch.

The sheet is removed from the face of the forming cylinder by a rubber couch roll. The sheet is then repulped



CUTTER AND LAYBOY, supplied by Lamb-Grays Harbor, follow directly behind dryer, are equipped with dual slitters to cut wrappers and sheets for baling. Stacks weigh approximately 450 lbs. each. Dry end rollers (background) show simple construction of dryer. Bearings, on outside, can be changed without shutting down.

in a shredder conveyor at the discharge of the forming cylinder. It is then ready for threading in the wet end of the pulp dryer.

The press section of the wet end has two heavy duty presses with a set of two 5 ft. dia. Sandy Hill predryers located between them. The first press operates at 1800 lbs. per linear in. pressure and the second at 2800. Both are equipped with anti-friction bearings. When the sheet leaves the second press it enters the dryer where it makes 17 horizontal passes for a total sheet length of about one-third of a mile inside the dryer.

Inside the dryer, a hot stream of air is used to convey the sheet and dry it at the same time. The high velocity of air also acts to obtain a higher specific evaporation capacity with subsequent reduction in dryer size and higher operating speeds. Actually an air cushion is created around the sheet.

Heat is provided by steam coils and an economizer mounted on the roof recovers a major portion of the exhaust heat from the dryer. This heat is used to preheat fresh air makeup to the dryer and heat water for the sheet former. A hold-back press located between the drying machine and the cutter regulates the amount of tension on the sheet.

The dryer is driven by a 200 kw Reliance Electric & Engineering motor

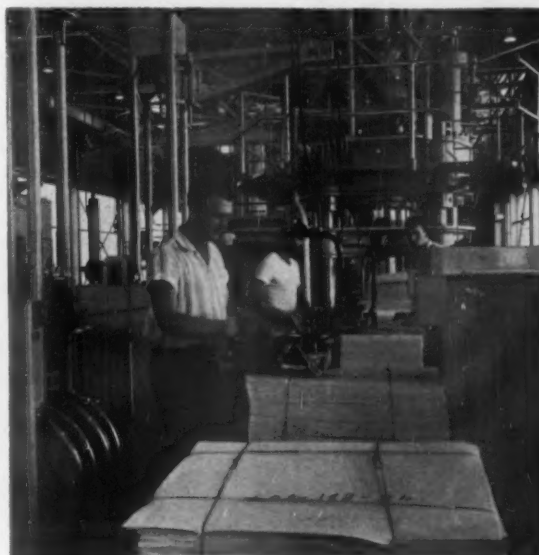
generator set with dc drives mounted on each piece of equipment. Control devices measure and control tension between each section of the dryer.

The finishing operation follows directly after the dryer. Pulp is fed directly into a Lamb-Grays Harbor cutter and layboy where it is cut into 26 in. by 32 in. sheets and accumulated in stacks of about 450 lbs. The cutter is equipped with a dual set of

slitters to cut either wrappers or sheets for baling.

Sheet stacks move by conveyor to a set of scales for weighing and are then transported to an 800 ton capacity Washington Iron Works baling press. The bales are tied, stacked and lowered automatically to the ground floor where they are transported by Clark fork lift trucks to railroad cars for shipment.

BALES ARE
PRESSED into
stacks in 800-ton
Washington Iron
Works press and
strapped with semi-
automatic Tennant
wire tying machine



BOWATERS CATAWBA



ONE OF THE WORLD'S MOST MODERN PULP MILLS, Bowaters' Catawba plant features entire walls such as this one which can be opened to admit breezes. In the background, through the slatted walls, is Bowaters Board Co., which next year will start making 120 million square feet of board a year from all types of hardwoods.

New Pulp Source Needed, for Bowaters (Believe It or Not) Expands Its Empire

It wasn't too long after the Bowaters Organization had its multi-million dollar mill going full tilt in Calhoun, Tenn., that it became evident an additional source of pulp was needed for Bowaters' other mills.

The rapidly growing domain of this largest newsprint manufacturer in the world was creating an increasing demand for pulp. It could not be supplied by Bowaters' first U.S. mill in Tennessee.

In England alone, Bowaters companies were making a widely diversified variety of papers including fine papers, kraft bags, corrugating medium, multiwall sacks, fibre drums and containers, cartons and boxes. In all, Bowaters has 50 companies sprawled over the map—in Norway, Sweden, Ireland, Belgium, France, Italy, Australia, South Africa, as well as Great Britain and North America. And while two-thirds of its two million tons a year production was in newsprint, the all

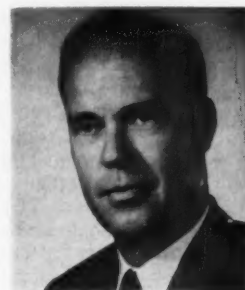
important last third demanded more and more pulp.

That was the situation in 1955 when an extensive search was launched to find a new mill location in southern U.S.A. Wood, water, power, good transportation, good climate all led searchers to Catawba, S.C., a blink-of-the-eye town in southern South Carolina near Charlotte. The one major obstacle to this location, a South Carolina law prohibiting foreign companies from owning more than 500 acres, was changed in 1956. Law now permits them to own 500,000 acres.

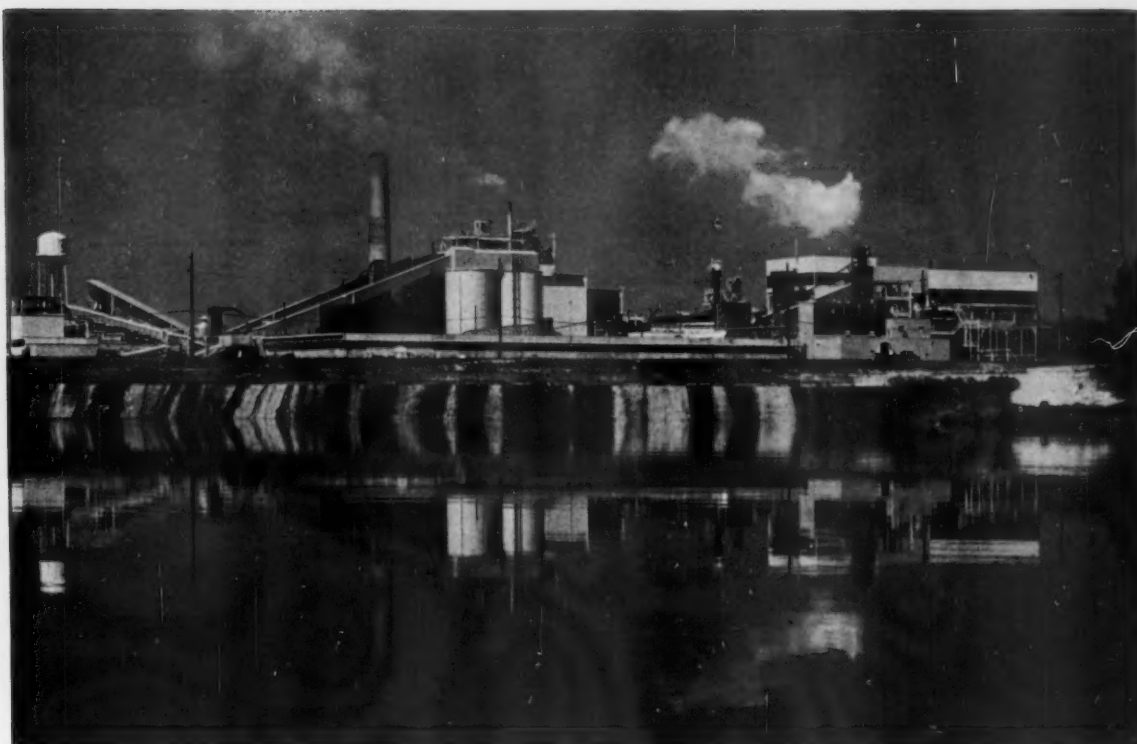
The Bowaters "Roll Cell"

Completed early this summer, the 400-ton pulp mill is an exciting addition to the Bowaters roll call. Bowaters now has newsprint mills at Corner Brook, Newfoundland and Liverpool, Nova Scotia (both in Canada) and Calhoun, Tennessee, (U.S.A.) and early this coming year will put into produc-

tion Bowaters Board Co., also at Catawba, the first hardboard mill on the east coast of U.S.A. It will produce about 120 million square feet of hardboard annually and will give the organization a well diversified North American picture to add to such other projects as its Scandinavian mills, producing mechanical pulp for English mills, Bowaters newsprint expansion in England, the two Bowaters-Scott tissue machines there, and a partnership between Scott Paper, Bowaters and



TOP MAN at new Bowaters mill is native Alabaman T. C. BANNISTER, who was formerly sulfate pulp supt. at newsprint mill in Calhoun, Tenn.



CATAWBA MILL IS LAID OUT IN STRAIGHT LINE as this picture shows doubly. Woodyard is at left, chip storage is in center with power house and recovery behind it, pulp drying and finishing facilities are housed in building at right.

Papeteries de Belgique of Brussels, to convert household tissue and market it in Common Market countries. Now in the works is a second Bowaters-Scott project near Melbourne, Australia.

Heading the Bowater Paper Corp., Ltd. and a number of other major Bowater companies throughout the world is dynamic Sir Eric Vansittart Bowater, son of an English nobleman whose dreams of becoming a professional soldier were abruptly ended in 1917 at Ypres, where he was wounded seriously. In 1924 he joined his father's business, a small firm of paper merchants with about \$500,000 capital. The firm entered the manufacturing field three years later with a newsprint mill at Northfleet, Kent, England. The following year the 32-year-old ex-soldier took over as head of the company. Today it is a \$400 million industrial giant with subsidiary companies operating ocean freighters, hydro-electric plants, highway transportation and other services.

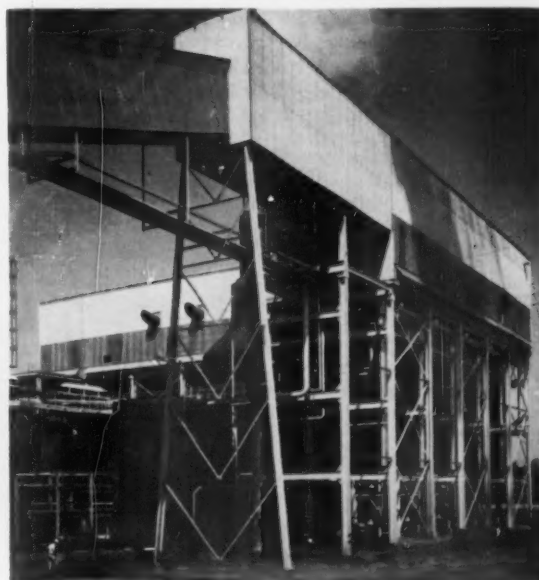
Bowaters spread its "umbrella" over the U.S. in 1954 with its newsprint mill at Calhoun, expanded it in four years from a two-machine, 130,000 ton operation to a four-machine, 430,000 ton-a-year operation. Its machines pioneered new speeds in newsprint production and the fourth was de-

signed to produce at speeds up to 3,000 fpm.

Bowaters Carolina Corp. has adequate provisions for future expansion from its present 400 ton-a-day capacity. Its daily chemical consumption: 20 tons of salt cake, 25 tons of chlor-

ine, 10 tons of caustic and 18 tons of lime. Engineering and construction of this project were handled by Bowaters Engineering and Development, Inc., Calhoun, Tenn., and general construction was in the hands of Daniel Construction Co., Greenville, S.C.

PLANNED FOR FUTURE, new mill features areas such as digester building with space provided at left for addition of sixth vessel.



BOWATERS CATAWBA



MOVING ON CONVEYOR DESIGNED by Bowaters and equipped by B. L. Montague, chips are delivered above digesters.



CHIPS ARE DELIVERED through conventional chute to one of five Chicago Bridge & Iron carbon steel digesters.

Cooking, Washing and Bleaching — Some Innovations . . . Cleanliness is Accented

Rubber belt conveyors, designed and built by Bowaters Engineering and Development and equipped by B. L. Montague, deliver chips to five 4360 cft Chicago Bridge & Iron digesters. The 50 ft. high digesters were fabricated from 2 in. steel, will cook 55 tons of chips and produce 13½ tons of pulp during a 3 hr. 15 min cook. The chips are loaded from an overhead rubber belt conveyor. Provision has been left in the digester line for a sixth digester.

Pulp discharges through electrically operated Yarway blow valves into individual blow lines to a 71 ft. blow tank with about 33 ton capacity. White and black liquor for the cook are provided by measuring tanks which have been located just above the operating floor and deliver liquor by gravity.

Blow steam passes through a special cyclone in the head of the blow tank to an accumulator and DeLaval blow steam recovery system for heating water.

Relief steam from the digesters is carried to individual separators and then to a Foster-Wheeler relief cyclone, condenser and decanter for the recovery of crude turpentine. A pair of 10 ft. dia. tanks surrounded by a dike are used for collection of turpentine and for further separation and decanting of the by-product.

Washing is Thorough

A specially designed trap with an electro-magnet clears tramp metal before pulp is delivered from the blow

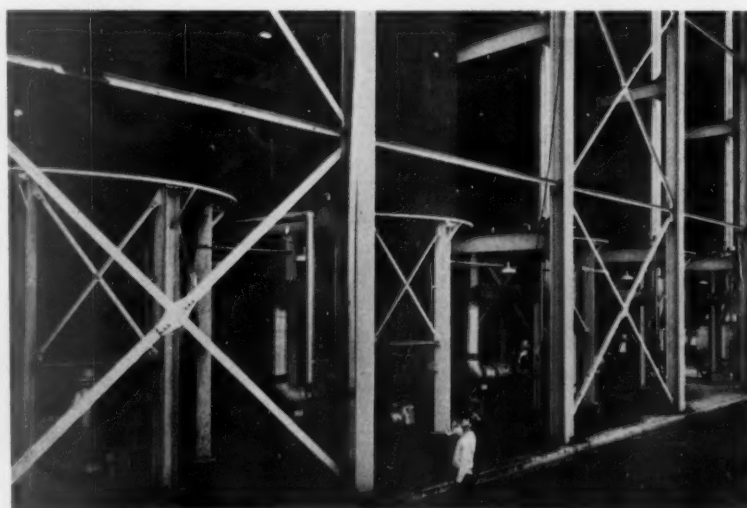
tank to one of two Emerson Claffin refiners. Stock is controlled at 3½% consistency by the motor load on the Black-Clawson blow tank agitator and by a DeZurik consistency regulator, located just ahead of the Claffins.

Brown stock is washed in three 11 ft. 6 in. by 20 ft. Dorr-Oliver vacuum type washers with space provided for a fourth washer. A belt conveyor delivers stock to the 150 ton Chemical Linings tile-lined high density storage chest. It has a Black-Clawson agitator in the bottom and dilution nozzles for stock dilution.

Stock once again is controlled at 3½% consistency by a pipeline regulator and Fischer & Porter flow indicators. It discharges directly into an agitated surge and blending chest built by Chemical Linings.

A 20 ft. high filtrate tank with three equal-size compartments, one for each of the three washers, also has provision for a fourth compartment should the washing capacity be increased. A foam tank adjacent to the filtrate tank is equipped with a foam breaker and Viking pumps for drawing off soap.

Washers are located on a floor level with the digester charging room and have J. O. Ross hoods. A 30-ton Manning, Maxwell and Moore overhead crane serves the wash system.



DIGESTERS ARE ALL EQUIPPED with electric blow valves, will hold 55 tons of chips and yield 13½ tons of pulp following cook.



STOCK IS TREATED first in one of these Emerson Claflin refiners, then washed on Dorr-Oliver vacuum washers.



PULP IS CLEANED by washing, screening over Cowan screens, plus a battery of Bauer Cleaners and Sprout-Waldron refiner.

Bowaters has taken out plenty of insurance to guarantee clean pulp. From a surge chest, washed stock goes through a consistency regulator to a mix tank which feeds two primary Montague Cowan screens. Accepted stock goes from these screens by gravity into two 9 ft. 6 in. by 12 ft. Dorr-Oliver thickeners and into a screened stock chest.

Rejects go to a stock chest and are pumped through a consistency regulator to secondary Cowan screens. Accepted stock from the secondary screens is then given a second cleaning through a bank of six primary and three secondary Bauer Cleaners, after which is thickened on a Dorr-Oliver decker and stored in a tile-lined chest.

Rejects from the secondary screens go to a rejects chest and are pumped through a drainer headbox and magnetic separator to a tertiary screen. The accepted stock here goes by gravity to the secondary screen accepted stock chest and rejects flow through a drainer to a Sprout-Waldron disc refiner. These refined rejects are then discharged back to the secondary screen reject chest for recirculation through the tertiary screening system. Rejects from the Bauer Cleaners are dumped into the process sewer.

Three-Stage Bleaching

Two Black-Clawson Miami No. 6 brushing jordans are used to give stock a gentle refining as it flows from the screened stock chest, through a Foxboro magnetic flowmeter, to the chlorination stage of the three stage bleach plant.

The bleach system consists of chlorination, caustic and calcium hypochlorite. Stock is chlorinated in a 17 ft. dia., 90 ft. high tile-lined tower with a circulator at the bottom and a rubber-covered skimmer and launderer at the

top. After discharge it flows by gravity to a 9 ft. 6 in., by 16 ft. rubber covered Dorr-Oliver vacuum washer which has a screw conveyor for discharging of the pulp through a steam mixer to the caustic extraction tower, a steel 16 ft. dia., 60 ft. high tower with double circulators in the bottom.

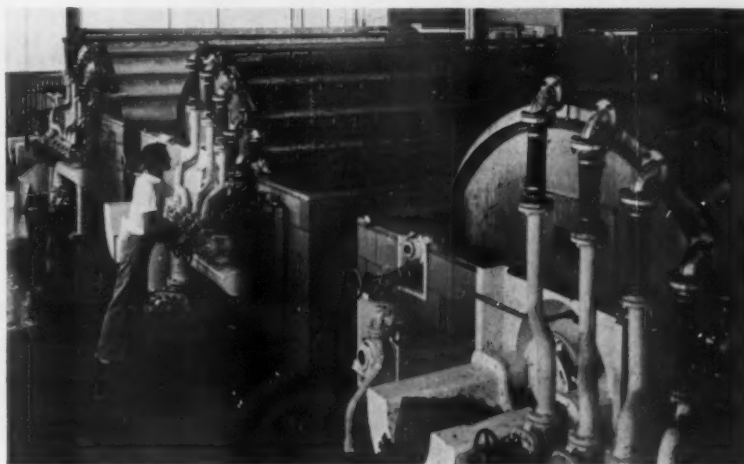
At the bottom of the caustic tower, stock is diluted by nozzles to approximately 1% consistency and pumper to a 9 ft. 6 in. by 16 ft. vacuum washer. The stock is then discharged by a cut flight conveyor, designed by Bowaters Engineering and Development, through a high consistency double-shaft mixer to a steel and tile calcium hypochlorite tower. The hypo tower also is 60 ft. high and equipped with two circulators.

After the hypo stage, stock is once again diluted and pumped to a third 16 ft. vacuum washer which discharges the fully bleached stock into a tile-lined 61 ft. high density storage

chest. This high density storage chest is also arranged in such a way that it may be used as a secondary hypo or caustic stage if it should become necessary in the future.

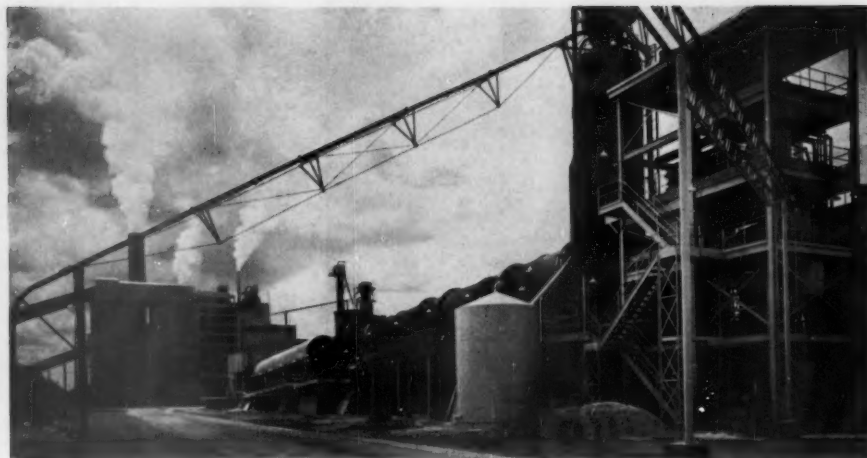
Washer vats and seal pits are tile-lined by Chemical Linings as well as the bleach towers. In some cases, seal pits are stainless steel plate, depending upon the type of service they are designed for. The pits are located on the mezzanine floor below the washers to minimize foam. Effluent from the chlorination and hypo stages as well as exhaust fumes and foam from all three bleaching stages is carried to a tile foam tower.

For the most part, instrumentation in the bleach plant is conventional. The operating room is located on the operating floor of the bleach plant and has a glass front panel giving a full view of the bleach room. In addition a 25-ton Manning, Maxwell and Moore crane serves the bleach department.



STOCK IS BLEACHED in three-stages using chlorine, caustic and hypo. Dorr-Oliver vacuum washers are used.

BOWATERS CATAWBA



STRETCHING OUT 265 FT., 10 ft. diameter lime kiln is one of the largest of its kind in world, according to Bowaters. It is one of many such kilns.

Power and Recovery are Centrally Located New Lime Kiln is One of World's Biggest

The power plant consists of a combination bark, oil and gas boiler, a chemical recovery boiler and automatic extraction, condensing type turbo-generator.

The combination boiler is a Babcock & Wilcox two drum sterling type with provision for coal burning. Its capacity is 300,000 lbs. per hour of 850 psig, 900° F. total temperature. Maximum continuous rate for burning bark is 75,000 lbs. hr. generating 200,000 lbs. hr. of steam. The forced draft fan delivers 143,000 cfm at 100° F. and the induced draft fan 308,000 cfm at 470° F. The power includes a continuous tube economizer, dust collector and manually operated steam soot blower.

The B&W chemical recovery boiler with cyclone evaporator is designed to burn 1,350,000 lbs. of black liquor solids and generate 208,000 lbs./hr. of 850 psig, 825° F. steam. Boiler passages are cleaned by automatic sequential, steam blowing, air motor driven soot blowers supplemented by steam hand lances where required. Two 2200 gpm Worthington black liquor pumps recirculate the heavy black liquor to spray nozzles at the top of the evaporator.

The water-cooled, chrome ore lined furnace floor slopes to twin smelt spouts discharging into a 22 ft. dia. lined dissolving tank. Side entering propeller type agitators and green

liquor recirculating pumps keep liquor in constant motion.

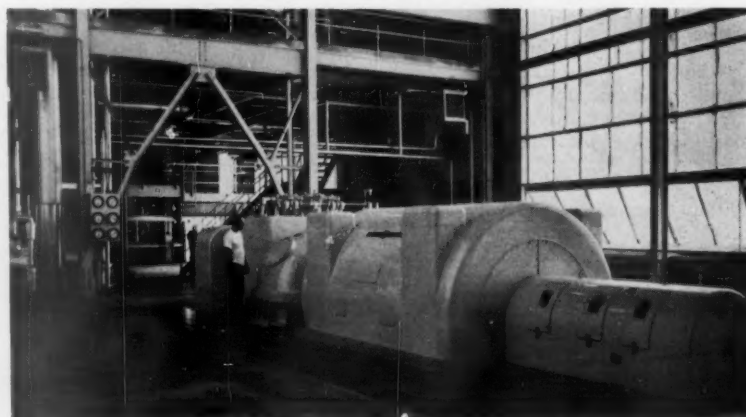
The two boilers are served by a single 175 ft. stack.

Electric power used in the pulp mill is generated by one 12,500 kw, single automatic 150 psig extraction, condensing, 3,600 rpm turbine generator. The General Electric unit is equipped with an Ingersoll-Rand Terry turbine drive and air compressor. It is designed for initial steam conditions of 850 psig, 900° F. Generator capacity is 15,625 kva. Both the generator and

exciter are protected against fire by means of an automatic carbon dioxide fire extinguishing system.

In addition there are two pressure reducing and desuperheating stations to provide an independent source of steam. One unit produces 850 to 150 psig steam and reduces temperature from 900 to 550° F. The other reduces 150 psig to 50 and 550° F. to 350. This equipment operates in parallel with the automatic extraction turbine and auxiliary steam turbine drives. The three Ingersoll-Rand split-casing boiler feed pumps are 1200 gpm capacity of 300° F. water at a discharge pressure of 1,235 psig.

Also located in the power plant is the mill's two-stage, duplex, double-acting air compressor with a capacity



PART OF POWERFUL POWER PLANT is 12,500 kw General Electric turbine generator. Steam and recovery are generated by Babcock & Wilcox bark and chemical recovery boilers.

of 1,611 cfm free air compressed to 110 psi. About 310 cfm of free air is needed to control automatic devices. This is supplied by a horizontal, single stage carbon ring type compressor with a 75 hp motor. Control air is dried by a Pittsburgh Lectrodryer with fully automatic controls.

Electrical controls as well as operator panels and turbine surface condensers were all supplied by Westinghouse.

Chemical Recovery is Simple

The Goslin-Birmingham six-effect evaporators are U-shaped and the six bodies are equipped with surface condensers and external separators. The unit is designed to concentrate 428,000 lbs./hr. of kraft black liquor from 14 to 50% total solids when supplied with 56,000 lbs./hr. of 45 psig steam. Expected rate of evaporation: 5.52 lbs. of water per lb. of steam. The No. 1 effect is equipped with 2 in. dia. seamless stainless steel tubes. The other tubes are welded carbon steel.

Salt cake is handled by an airveyor system with 10 tons an hour capacity. It is collected from the recovery boiler by means of a Koppers electrostatic precipitator. It is a double chamber, 40 lane pressure type with glazed tile walls and will handle 165,000 cfm of 330° F. gas containing a dust load of 2.0 grams per cft. Its two fields are 20 by 20 ft.

The Dorr-Oliver causticing plant is conventional with clarifiers and wash tanks installed in line with pumps arranged to permit another set for future expansion. The system is also arranged with spare pumps available for possible future growth in the mill.

The lime kiln, largest of its kind in existence, is 265 ft. long, 10 ft. in dia. and has a capacity of 120 tons per day.

How Effluent Is Handled

Bowaters has developed a unique system for treating effluent at Catawba. It consists of two sedimentation basins about 390 ft. long. They are served by a single canal from the plant waste system. A diversion structure makes it possible to divert the flow of waste to either of the two lagoons, making it possible to clean one at a time. Waste discharges into either of these waste lakes across a continuous 460 ft. weir plate. It then passes over a rough concrete apron some 50 ft. wide before entering the basins.

At the discharge of the basins, waste flows across an additional weir 750 ft. long and across a second concrete apron. A third weir and concrete apron are 720 ft. long after which waste settles in the stabilization basin, a 5700 acre-feet lake separated from the



FLOWING OVER ONE OF SEVERAL WEIRS, pulp mill effluent goes through a portion of the elaborate waste treatment system. Two large lagoons permit very close control.

Catawba River by an earth dike.

A 48 in. dia. magnetic flowmeter with motor control valves at either end accurately proportions the amount of effluent going into the river. The effluent is fed into the river through a diffusion line along the bed of the stream. It is 385 ft. long and equipped with thirty-four 8 in. dia. nozzles with flap valves to insure equal distribution across the stream.

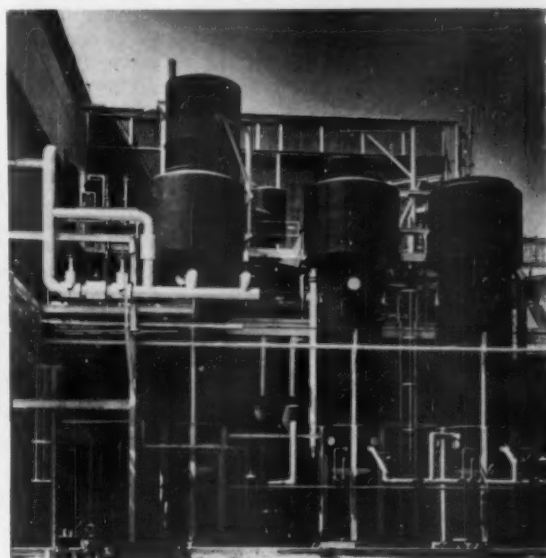
Kinds of Piping

Every conceivable type of piping was used in construction of the Bowater Carolina mill, from straight carbon steel to saran and plastic lined piping. Carbon steel pipe, for instance, was used in the digester, washing,

screening and recovery areas. Feed-water and condensate lines were also carbon. Stainless steel was used for hot caustic lines and for stock and white water service while polyester impregnated fiberglass and rubber-lined pipe was used in the chlorination stage of the bleach plant. Gate and stock valves, most of which are Fabri-valves, are stainless steel throughout the stock and white water systems.

For the story of how Bowaters will use 275,000 cords of pulpwood a year in its new pulp mill and 40,000 more in a board mill due on-line next year, turn to page 146.

ONLY HALF OF U-SHAPED six-body, sextuple effect Goslin-Birmingham evaporator can be seen in this picture. It will concentrate 428,000 pph of black liquor from 14 to 50% solids.



Plastics in Coating Future

... attract more than 450 to TAPPI meeting. In the spotlight: Polypropylene and Pure Food & Drug's new amendment.

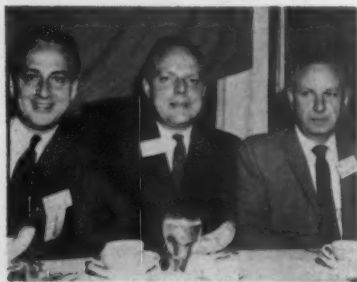
By DON W. ZEIGLER
Midwest Editor, PULP & PAPER

—Chicago
● This has been the decade of plastic coated paper and board. But, the future holds promise of even greater expansion in this rapidly-expanding field.

At the recent 14th annual TAPPI Plastics-Paper Conference in Chicago the 1960s were pictured as years of almost unbelievable growth in this relatively new and untried field of paper manufacture. During the 1950s, according to one spokesman, some 30,000,000 lbs. of polyethylene were used each year in coating. This figure, according to John V. Eller, will jump to 150,000,000 lbs. annually by 1985.

Mr. Eller, technical director for H. P. Smith Paper Co., Chicago, warned that the cooperation of all involved in coating will be vital to the success of the many innovations that are sure to come. Triggering this expansion, he said, has been the desire on the part of the consumer for better and better packaging materials. That alone, however, is not enough.

"For expansion in plastic coating," he said, "we need the help and understanding of the packaging equipment manufacturers and all the technical and marketing advice available from the plastics and paper industries as we explore the nylons, the polypropylenes,



Hardy Sturken Pullman

CONFERENCE LEADERS at Chicago's Edgewater Beach—W. L. HARDY, International Minerals & Chemicals Corp., general chairman; R. C. STURKEN, Frank W. Egan & Co., chairman, TAPPI's Converting & Consulting div., and J. C. PULLMAN, American Cyanamid Co., divisional vice chairman.



Sutton Stannett Morris Brandt Downs

REPORTING ON TECHNICAL ASPECTS OF PLASTICS COATING AT CHICAGO—C. C. SUTTON of General Foods Corp.; V. T. STANNETT of New York State College of Forestry; J. F. MORRIS of Spencer Chemical Co.; Y. M. BRANDT of Reynolds Metals Co., and M. L. DOWNS of Thilmany Pulp & Paper Co. Mr. Sutton served as chairman of the session.

the polystyrenes, the polymers, the stretchable papers, the wax overcoatings, the saran overcoats and so on."

A Strong Candidate

Polypropylene's unique combination of strength, barrier and thermal properties, coupled with its attractive finished appearance, make this relative newcomer a strong candidate in the extrusion coating field. Summarizing the property advantages of polypropylene over conventional polyethylene as an extrusion coating material, W. J. G. McCulloch and A. J. Ward Jr. of Enjay Laboratories (Linden, N. J.) listed the following:

(1) Improved oil and grease resistance; (2) improved heat resistance; (3) lower moisture vapor transmission rate; (4) superior abrasion resistance; (5) superior appearance and gloss; (6) superior surface hardness; (7) greater stiffness and strength; (8) higher pound volume yield, and (9) lack of environmental stress cracking.

"These superior properties," the speakers warned, "are of immediate practical interest to potential end-users if polypropylene can be satisfactorily processed in conventional type equipment."

"The polyolefin extrusion coating market is predicted to grow to 100,000,000 lbs. per year by 1963."

Processing Characteristics

In determining the type of equipment and certain processing conditions that are required to obtain successful

thin coatings of Escon polypropylene at acceptable rates, Mr. McCulloch and Mr. Ward used a laboratory extruder 2½ in. in dia. with an L/D ratio of 16/1 and an accompanying web 24 in. in width. The substrate coated in this study was 50-lb. natural kraft paper. Principal emphasis was placed on the effect of certain design and operating variables on the melt drawdown characteristics of polypropylene. "These results should not be regarded as the optimum obtainable in the extrusion coating of polypropylene," the speakers declared, "but rather as a processing guide to those converters conducting initial coating programs with polypropylene."

"The principal restricting factor regarding the drawdown of polypropylene has been surge or loss of control of coating gauge. This effect can be greatly minimized with the proper choice of operating conditions such as die position and chill roll temperature, and with slight equipment modification such as die design. These special techniques are necessitated by the difference in rheological properties between polypropylene and conventional polyethylene. It is important to note, however, that in free film extrusion, speeds well in excess of 200 fpm have been obtained using conventional equipment."

Waxed Paper: Quality-Cost

Waxed paper can continue to be an increasingly valuable commodity if its quality-cost ratio is improved. Ad-

addressing the Converting Session of the TAPPI Conference, M. W. Kane, of KVP Co., had this to say: "Since the continuance of waxed paper does not appear to be indispensable to the survival of any one particular industry, the combined efforts of the petroleum industry, paper manufacturers, waxed paper fabricators, the consumer and the package machine manufacturer—the combined efforts of all of these will probably be needed if waxed paper is to retain its share of the market."

Mr. Kane predicted that the paper-board industry will consume some one billion lbs. of wax in 1965, as compared to 800,000,000 lbs. in 1959. The paper industry, on the other hand, probably will use about 250,000,000 lbs. this year and approximately the same amount in 1965. Miscellaneous uses, he said, will account for 250,-

000,000 to 300,000,000 lbs.

Details on Performance

As coaters become more familiar with a wide variety of substrates and resins, more detailed performance information must be made available to them. The reason, according to Du Pont Co. spokesmen: With broadening markets, there is a concurrent demand for wider product selection.

Speaking on "The Interaction of Processing Variables, Base Materials and Resins in Polyethylene Extrusion Coating," H. F. Sweeney and J. P. Goslin described the effects of processing variables on the adhesion and heat seal properties of each of five base materials (kraft, MSAD 80 and K type cellophane, mylar and aluminum foil):

1. Coatings of low-density resins result in a broad heat seal temperature range and relatively high seal strength.

2. The desirable effect of reduced sealing temperatures in low-density resins is accentuated by raising the melt index.

3. Regardless of resin parameters, particular substrates have strong influence on the seal strength level.

4. The melt index is the resin parameter having the greatest effect on adhesion.

5. Differences in surface properties and primers on smooth base materials result in variation in adhesion levels.

6. The temperature of the polyethylene as it contacts the web critically affects adhesion.

7. Density, melt index, molecular weight, distribution and other melt parameters combine to influence resin behavior.

8. Resin performance should be measured in terms of particular substrates.

Debate Obligations of Industry Under New Food-Drug Act Additive Amendment

A well-attended open session of the Plastics-Paper Conference voiced differences of opinion, but far outweighing these was general agreement that the industry's problems are not insurmountable. Solutions were expected through industry-government cooperation.

"Misconceptions as to the application of the amendment," said Arthur A. Checchi, asst. to the deputy commissioner of the U.S. Food & Drug Administration, "run the gamut from the belief that the amendment does not apply to packaging materials and their components to the opinion that it will never be possible under the amendment to secure authorization for the use of any packaging material where any quantity whatever of any substance migrates from it to food."

"One extreme is quite as ridiculous as the other. It is wrong to think that this law does not apply to packaging materials. It is equally wrong to think that authorization for use is unattainable. In short, we have before us two basic questions: First, does the food packaging industry have a problem? The answer is, 'Yes.' Second, is the problem an insurmountable one? The answer is, 'No.' Far from it. I hope we can create an awareness of this."

Mr. Checchi pointed to the considerable uncertainty in the food packaging industry today. "The man who uses the package," he said, "finds it hard to accept responsibility because he has no control over its production. He thinks the man who makes it

should establish its safety. The man who makes it says he neither uses the package nor has control over the identity of the raw materials he purchases. Thus, he thinks the man who uses it and the man who furnishes raw materials for its manufacture should establish safety. The raw material producer feels that once he sells a substance to a package manufacturer, he has no control over how or under what conditions it will be used or whether it will migrate. Thus, as he sees it, the problem of safety is one that needs to be solved by the other two."

"While it is true that the new law requires you to make certain adjustments in your procedures," Mr. Checchi concluded, "these can be made in an orderly fashion if approached unemotionally. There is in fact need for considerable work to be done; but, despite reports to the contrary, there is no reason for concern over the possible fate of this important industry if you get on with the job at hand. Adjustments can be accomplished. They simply need a little doing."

Proud of its Record

"The Paper Industry Story" in regard to the new amendment was presented by R. C. Wilcox, vice pres. for research and development, Marathon, a division of American Can Co. "The amendment has not precipitated a crisis," he said. "While we have recognized our obligations concerning safety of materials and are proud of our record, we will be required to meet even

higher standards. We will have to be even more aware of the industry's problems."

These higher standards and the extra work they require, he declared, may retard future development. Cost of technical advances will increase, tending to retard minor improvements and increase the price of major improvements. This will be the price that general economy will pay for greater safety of packaged food.

Plastics Industry Story

"Headaches" caused by the amendment were discussed by J. C. Wright, director of development for Visking Co., a division of Union Carbide.

1. Complexity of compliance and lack of clearly defined responsibilities as to which segments of the industry are responsible for compliance.

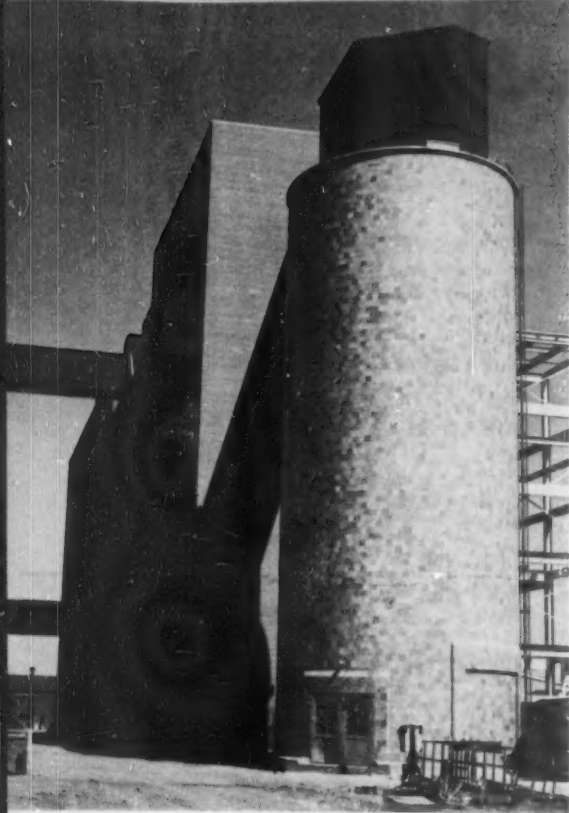
2. Lack of cases on which to establish a basis for future rulings.

3. Costs of compliance.

"The future position of the plastics industry," the speaker continued, "will be governed to a great extent by the resins and films employed in food packaging applications."

Converters' Story

That the new amendment is not easy to live with was the view expressed by G. H. Lacy, director of research, Dobeckmun Co., a division of Dow Chemical Co. But, it will be a necessary way of life since its purpose is to protect the public health. "While the real burden of responsibility falls on the food manufacturer," he said, "it is up to the basic packaging raw material manufacturers and converters to help him (the food manufacturer) discharge his legal and moral responsibility."



Highlights of Hammermill's Growth Program

1. Neutrancel pulp mill capacity doubled.
2. New chemical handling and bleach making facilities.
3. Finishing room expanded.
4. Roll handling mechanized.
5. Central broke handling.
6. New administration building.
7. New power boiler, water treatment.

NEUTRACEL PULP MILL is behind chip bin, which feeds Impco continuous digester.

\$20,000,000 To Grow

Using Neutrancel pulp process as basis for extensive growth program, Hammermill Paper Co. bids for continued leadership in fine papers

By MAURICE R. CASTAGNE
Eastern Editor, PULP & PAPER

● When Hammermill Paper Co. successfully probed the secrets of using hardwoods for fine paper pulps, it unleashed a tremendous surge in its industrial development. At the same time, the stage was set for a \$20 million growth program now culminating at its Erie, Pa. mill.

Too much emphasis cannot be placed upon the contribution which Neutrancel® has made and continues to make at Hammermill. It has eliminated Hammermill's dependence upon softwoods imported from Canada, an expensive operation. Now, based upon the success of its patented Neutrancel, a large volume fine paper pulp from

*Neutrancel is a registered trade mark of Hammermill Paper Co.

hardwood, Hammermill continues to grow.

There is a special significance in Hammermill's choice of the word *growth* to describe its present program, rather than *expansion* or *modernization*. The company believes it is growing in a logical, natural development in all of its operations, toward a bigger, more profitable operation.

The growth program involves a new continuous digester, doubling of its Neutrancel pulping and bleaching capacity, a new hardwood woodroom, sulfite mill modernization, new chemical handling and bleach making facilities, an expanded finishing room, a centralized broke handling system, a new power boiler, and a new ultra-modern administration building.

The part that research played in the growth program must not be overlooked. The development of the Neu-

trancel process together with the pioneering of new equipment and the many improvements and modifications to other processes, is the foundation upon which the whole project rests.

The direction of design and construction was the responsibility of Hammermill's engineering department guided by Dr. Donald T. Jackson, vice president and technical director and Kurt C. Neuenfeldt, chief engineer, assisted by Scott S. Hoffman, manager of manufacturing services.

Hammermill's project engineers worked closely with manufacturing, sales, financial and other divisions of the organization to provide the most efficient operating processes at the lowest possible cost.

Rust Engineering Co., which built the original Neutrancel plant, was again selected to construct the entire \$20 million growth program.

1. Pulping: Refinements in Neutrancel

A major change in Hammermill's process today is two stage pulping of softened chips coming from the digester

When Hammermill's research organization proved the success of the Neutrancel pulping process, the company boldly moved from the laboratory operation directly to a full scale commercial plant. At that time the company knew it had developed a new fiber. It also knew that it was working with some unknown factors in this new fiber but had to do some "educated guessing" in determining basic design factors such as the size of washers, retention time in the bleaching towers, etc.

That was five years ago. At that time, PULP & PAPER reported in an exclusive feature article that the Neutrancel bleach plant was sized for quick doubling of capacity. Today's Neutrancel expansion proves that Hammermill was right; that the basic design five years ago is still valid.

Since then Hammermill's research men have developed some important modifications of the original patented process. One of these is two stage pulping of the softened chips as they come from the digester. The first stage uses a Shartle-Sutherland breaker trap which is essentially a fixed gap refiner. This provides a preliminary breakdown of the chips and makes it possible to pump a uniform stock at the desired consistency (5%) to the second stage refiners. These are Sprout-Waldron single disc refiners which perform final disintegration of the fiber bundles to individual fibers.

Mixed northern hardwoods are cooked either in existing batch digesters or the new Impco continuous digester (see story in PULP & PAPER, September 1959).

From the digesters, pulp is pumped at 2% consistency at 1467 gpm to one of two breaker traps operated in parallel, where it is defibered. Consistency is increased to 5% in an Impco decker and the pulp is discharged to a 36,000 gal. capacity decker chest for 36 min. retention.

From the decker chest, stock is pumped at 5% consistency at 586 gpm by a Goulds pump through an Eriez magnetic separator to one of five Sprout-Waldron disc refiners (four existing, one new) and into a 15,000 gal. capacity refined stock chest. At 0.5% consistency, stock is pumped to the Bauer Centri-Cleaners (developed by Hammermill Paper Co.). A Brown consistency meter, developed in cooperation with Hammermill, which uses infrared heat to detect stock density, is ahead of the primaries. This unit, says Hammermill, is exceptionally good at low consistencies (0.3 to 0.6%).

There are 56 primary Centri-Cleaners, eight secondaries and three tertiaries, with provisions for adding another 56 primaries, 10 secondaries and four tertiaries. Centri-Cleaned stock is thickened in two deckers in series and drops by gravity to a thickened stock chest at 5% consistency. Stock is then pumped to the 48,500 gal. capacity

brown stock chest in the bleach plant.

Neutrancel Bleaching

Bleaching of Neutrancel pulp is one of the key points in Hammermill's growth program. The bleaching process is the standard chlorine, caustic extraction and hypochlorite sequence.

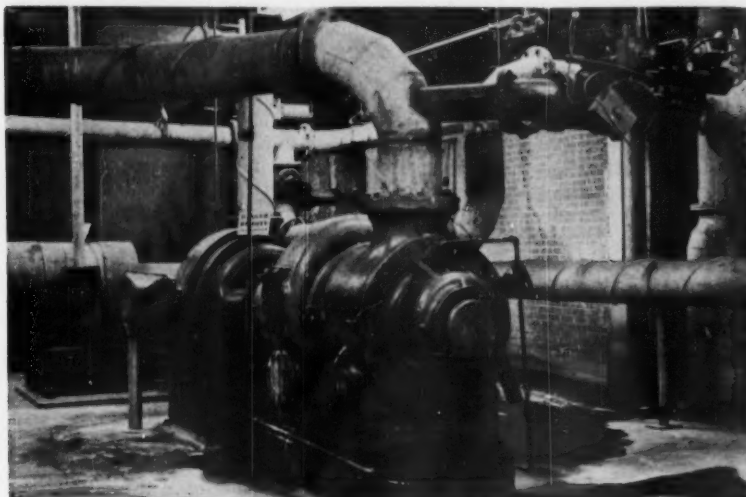
As mentioned above, the original Neutrancel plant was designed so that additional equipment necessary to double its capacity could be added. Space was left for a second chlorine washer, a second caustic washer and a second hypo tower. These have been added as part of the growth program and, based on past operating experiences, will be sufficient for the planned pulp production. In addition to these main pieces of equipment, various auxiliary units such as chemical mixers and filtrate tanks have been installed.

The existing chlorine and caustic towers were designed large enough to handle the increased pulp production. Control of retention time in the hypo stage is more critical than in the other stages so the original design had to be based on 100 tons per day with provision for the second tower when production doubled. The hypo washer was sized to handle the expanded capacity.

Another recent innovation in the Neutrancel process is use of an ORP cell to control chlorination of the pulp. From the chlorine mixer the chlorinated pulp goes through a pre-retention tower and is then pumped to the chlorination tower. The ORP cell measures the residual chlorine between the pre-retention and chlorination towers. The signal is used to control the addition of chlorine to give the proper residual chlorine at this point. Thus any variations in chlorine demand are sensed and the necessary correction made almost immediately. This has greatly improved the uniformity of this important step in the bleaching sequence. In addition caustic and hypo stages are under much better control because a uniformly delignified pulp comes from the chlorine washer.

Hammermill has shown that the best balance of fine paper properties is obtained by blending different pulps. To complement the properties of Neutrancel, Hammermill has developed a new long-fibered softwood pulp with improved properties.

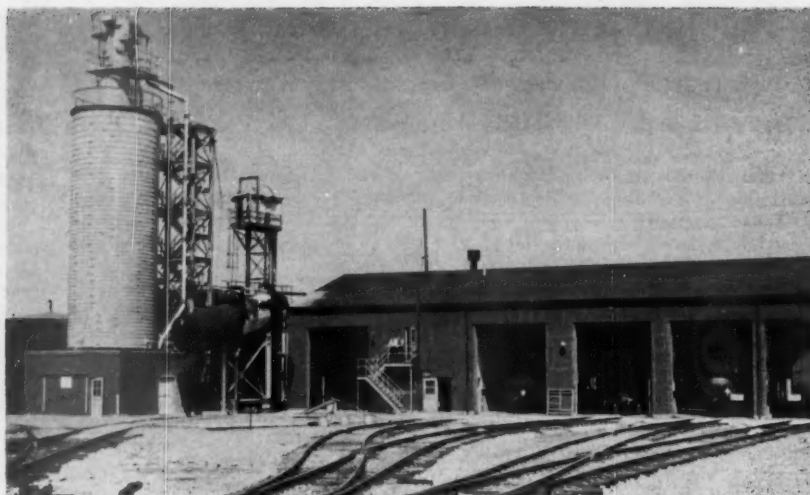
As is the case when the original Neutrancel story was published in PULP & PAPER, certain details of the new process must await patent action before publication. The sulfite pulp mill has been rebuilt to improve operations at a lower cost and to permit process flexibility giving a wide variation in pulp properties.



IMPORTANT MODIFICATION of original Neutrancel pulp process is use of this Shartle-Sutherland breaker trap which makes it possible to pump a uniform stock to second stage refiners.

**\$20,000,000
TO GROW**

CHEMICAL PROCESSING IS CENTRALIZED here. Plant houses five car unloading bays, water softening system, compressed air system and continuous bleach making operations.



2. Chemicals: Processing is Integrated

Centrally controlled by one operator, four basic chemicals are unloaded, handled, prepared for further processing by one operator

In designing its chemical processing plant, Hammermill Paper Co. decided to integrate unloading, handling and preparation of four of the basic chemicals it uses in pulp manufacture. In this operation, which is centrally controlled by one man, rail shipments of bulk chemicals are unloaded and processed to final form for use in pulping and bleaching operations. Chemical processing includes dilution of caustic soda, preparation of soda ash solution and manufacture of calcium hypochlorite from burnt lime and chlorine.

In addition, the chemical plant houses two Hungerford & Terry 442 gpm water softeners for caustic and soda ash dilution and a compressed air system for unloading the chlorine cars and for instrument air.

Liquid Chlorine

Liquid chlorine is used directly in pulp bleaching and in the manufacture of bleach liquor. It is unloaded from tank cars by padding the cars with compressed air. The liquid chlorine flows through an alarm loop which is forced down by the weight of chlorine in the loop. When the flow stops, the loop becomes empty and springs up, activating an alarm.

After the liquid chlorine has been removed from the tank car, the remaining gas is evacuated through the bleach liquor system using a chlorine line drainage eductor. This eductor is 3-in. PVC lateral with a Hastelloy C nozzle and it is also used to protect

employees from chlorine fumes by induced draft through the eductor when the stainless steel pipe lines handling liquid chlorine are taken down periodically for inspection and cleaning.

Lime Unloading and Slaking

Pebble lime is unloaded from hopper cars by a Fuller air conveyor and filter system. Lime is filtered from the air stream in a filter bag house and drops into the lime storage silo.

Lime is then fed from the silo to the slaker by a gravimetric feeder which provides a continuous flow of the required amount. The slaked lime passes through a grit removal compartment, where dirt is removed, and flows into the slaked lime storage pit, where it is further diluted. Flows of dilution water to the slaker and storage pit are controlled in proportion to the amount of lime being slaked. The slaked lime is pumped to the bleach making process from the storage pit. The system can provide 70 gpm of 4% slaked lime.

Continuous Bleach Making

Calcium hypochlorite bleach solution is prepared by reacting liquid chlorine with the slaked lime. In order to properly control the operation, the slaked lime is mixed with some of the final bleach liquor, which is recirculated from the chlorinating tank before passing through a mixing tee where the liquid chlorine is injected. The chlorinated solution is returned

to the chlorination tank when the reaction between the lime and chlorine is completed.

From the time the lime slurry and the liquid chlorine are mixed together until the final hypochlorite is delivered to a storage tank, all piping is Carlon PVC. After the lime slurry and liquid chlorine are mixed they go through two parallel coils of 3-in. PVC, each coil containing 24 elbows at a velocity of 5 fps. The mixture then goes into a tank where large pieces of grit are settled out. From here the mixture passes to the Dorr-Oliver Dorrclones where unreacted lime and solids are removed. Underflow from the Dorrclones is recycled through the system by PVC pipe. Clear overflow is piped to the bleach plant tank from which it is metered by a Hypomixer.

The bleach making system can supply 123 gpm of bleach liquor with 2% available chlorine.

The bleach liquor strength is controlled with an oxidation-reduction potential (ORP) cell using silver and platinum electrodes developed jointly by Hammermill and Diamond Alkali Co. The oxidation-reduction potential is a function of the relative concentrations of the oxidized and reduced reactants in the system and provides the signal that regulates the flow of chlorine to give the desired calcium hypochlorite concentration.

Soda Ash Unloading

Soda ash is unloaded from hopper cars by a Fuller air conveying system into a storage tank. There are two soda ash unloading lines and soda ash may be unloaded from either of two railroad bays.

Soda ash is dissolved and stored as a 25% to 30% solution and is pumped to a dilution tank where it is diluted with soft water from the Hungerford & Terry water softeners to a 5% solution. The dilution is controlled by a Fisher governor density controller in the dilution tank. The dilute soda ash is then pumped to the Neutrancel liquor preparation plant. The dilution system can supply 430 gpm of dilute soda ash.

Caustic Soda

Caustic soda, in 50% solution, is unloaded from tank cars by a Mission centrifugal pump to the caustic storage tank. The 50% caustic is pumped to a dilution tank where it is diluted to a 10% solution with soft water. Dilution is controlled by a Foxboro density controller in the dilution tank. Nalco 918 is added to the dilute caustic to prevent scaling. The dilute caustic is then pumped to storage tanks in the bleach plants. The dilution system averages 100 gpm of caustic.

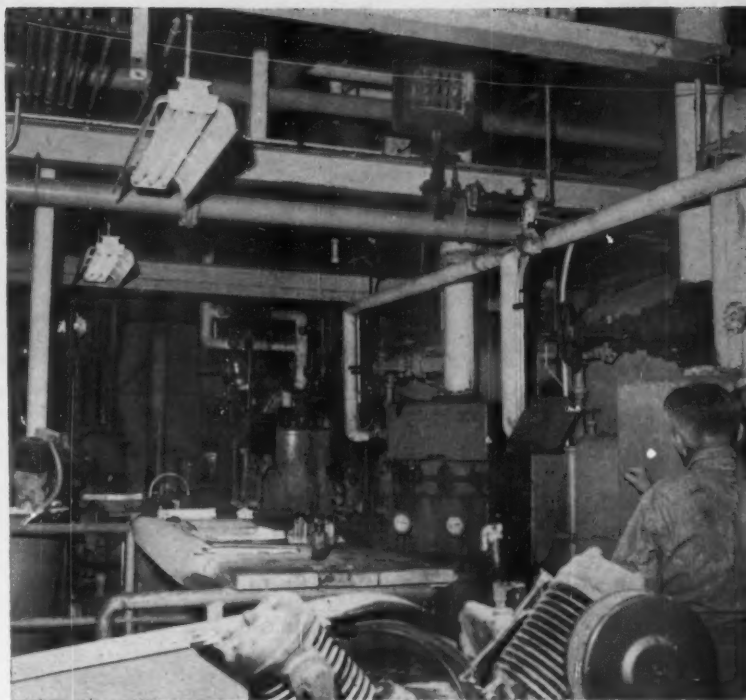
Sulfur Burning

Although physically removed from the rest of the chemical processing facilities the sulfur burning and cooking liquor preparation plant is a very important aspect of Hammermill's chemical processing. To provide cooking liquor capacity for the increased Neutrancel production a new sulfur handling and combustion plant has been installed.

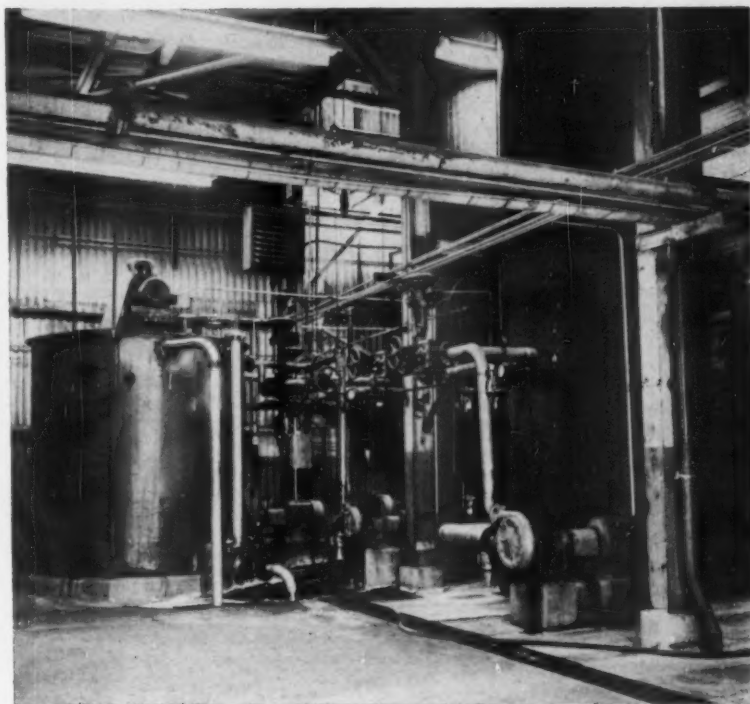
Sulfur is unloaded from hopper cars into a hopper in the ground and moved by bucket elevators to a storage bin over the sulfur melters. Liquid sulfur goes to a heated liquid storage tank and is then pumped to the rotary sulfur burner. A level control in the burner returns excess sulfur to storage. Sulfur oxidation is completed in a two-compartmented combustion chamber. From here the sulfur dioxide goes to a primary and secondary spray cooler where the temperature is reduced to about 200°F. Cooling water flows countercurrent to the gas stream to minimize losses of sulfur dioxide. Gas strength is regulated with Minneapolis-Honeywell SO_2 controller. The sulfur burning system has a capacity of 50 tons per day of sulfur.

Cooking Liquor Preparation

Neutrancel cooking liquor is prepared by absorbing sulfur dioxide in soda ash solution. Diluted soda ash is pumped into the top of the Neutrancel absorption towers; SO_2 gas 200°F., 75 lb/min. into the bottom. The Neutrancel tower is 78-in. dia. by 24-ft. high with a Pyroflex-lined steel shell and has a 16-ft. high bed of 2-in. porcelain berl saddles.



BLEACH MAKING and WATER SOFTENING systems (right) are controlled here. In bleach preparation, from the time the lime slurry and liquid chlorine are mixed together, until the final hypochlorite is delivered to a storage tank, all piping is Carlon PVC.



NEUTRACEL COOKING LIQUOR IS MADE here. The finished Neutrancel cooking liquor is pumped to the new continuous digester or batch digesters as needed.



**\$20,000,000
TO GROW**

DIMENSIONS ARE STRIKING FEATURE of new finishing room. Total floor space on two levels is size of five football fields. At far left are sheeting operations, next sheeted storage, then sorting followed by sorted storage and then trimmers.

3. Finishing: Orders Processed as Unit

Roll paper moves from machine through finishing to trimmer without lost time; each operation flanked by storage areas for independence.

In the last thirty years Hammermill's paper production has doubled and while finishing operations have been kept up to date, the company decided to make some sweeping improvements. The results, in the words of one mill visitor, have set a new standard among finishing rooms.

A striking feature of the new facilities is its dimensions. The total area covers some 234,600 sq. ft. and is designed to handle 450,000 lbs./8 hr. shift. To appreciate the size involved, the main finishing room is about the same size as 2½ football fields, with a similar area on the ground floor for auxiliary operations such as embossing, rewinding, roll wrapping.

A prime objective of the new system is to move roll paper from the paper machine through the finishing line to the trimmers without any lost time. The first thing Hammermill did was to provide for storage areas between each operation for complete independence. There are storage facilities for rolls, sheeted paper, and sorted paper. Under the new system Hammermill accumulates rolls of a particular order until the paper machine has finished its run and then the entire order is processed as one unit.

Cutters

Supplementing the existing four Hamblet and two Clark-Aiken cutters are two new Masson-Scott sheeters, 94-in. and 121-in., said to be the first such units in the United States. A special feature of these cutters is that the piler rises with the load, thus eliminating need for a pit or elevator. The

units also feature shadow ream marking and overlap delivery.

Each sheeting has a double backstand. Automatic levelators are used on the six existing cutter layboys. These were developed by Howard Smith Paper Mills, Ltd. and are licensed to Charles R. Stevens, Inc. Using a photocell, the levelator takes a reading of the height of the pile of paper and sends a signal to either a lowering or raising device. This frees the operator so that he can devote more time to inspection of the paper on the layboy.

The Clark-Aiken & Hamblet cutters are all equipped with Stevens counters which automatically index reams at any desired number of sheets.

After cutting the full set of production of one series, the skids are transferred to sheeted storage between cutters, inspection and counting area.

Inspection & Counting

The inspection and counting line extends the full length of the finishing room and consists of 36 pairs of American Manufacturing Co. inspection tables, each 4000 lb. capacity. Each scissor lift has spring-loaded toe guards as a safety feature so that the operator's toes cannot get under the platform. All have pushbutton control, 36-in. travel and individual hydraulic units. Here, the paper is inspected and counted, one ream at a time and then transferred to a second lift table.

Lighting is Unusual

One set of lights for sorting paper does not create an ideal viewing condition, says Hammermill. So, it de-

signed a double set to strike the paper at different angles and heights. One group of lights is a few feet from the sorting table and about 5-ft. high and strike the top sheet at a glancing level to show up such imperfections as wrinkles and shiny spots. The other set is positioned at right angles to the first and is about 7-ft. high. With this combination, says Hammermill, it can pick up most imperfections. Inspected and counted paper goes to a second storage area before trimming.

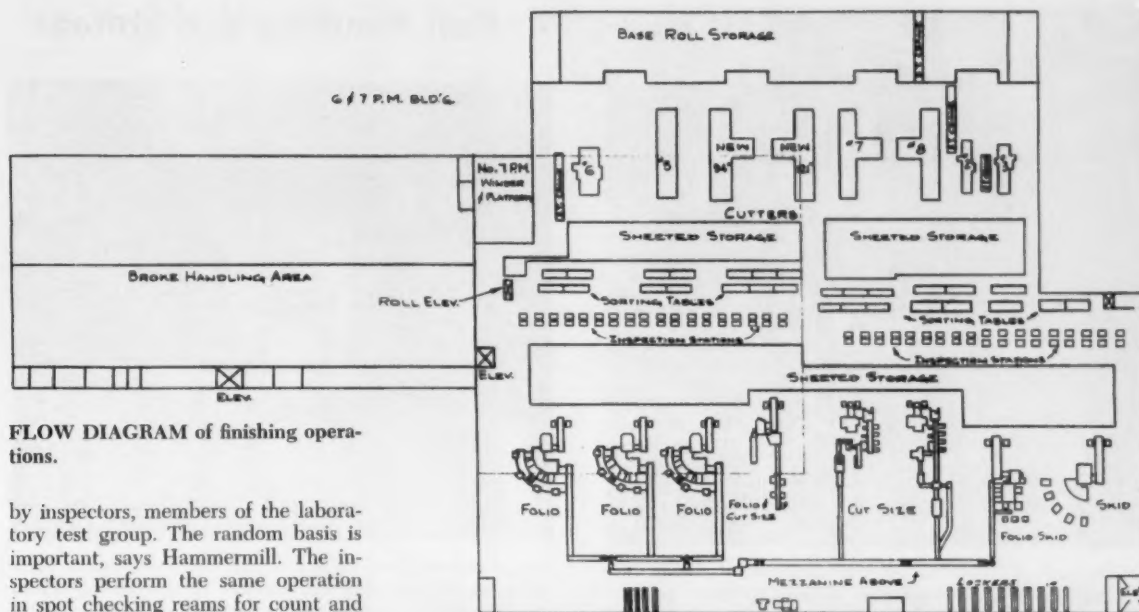
Trimming Operations

From inspected paper storage, skids of paper are loaded onto scissor lift tables positioned on two sides of a slat conveyor feeding the trimmers. All trimmers, except the cut size units, have backfeed to increase production. With backfeed, the operator handles the paper once—going out. The conveyors are controlled by the trimmer operator. On the backfeed trimmers, pusher bars controlled by Moore-O-Matic units feed the trimmers.

There are eight trimmers set in a straight line extending the full length of the finishing room. Trimmers 1, 2 and 3 are 85-in. Seybold auto spacers for carton packed stock; No. 4 trimmer line has a 65-in. trimmer for specialty grades such as ledger and notebook fillers and has a new Lawson high speed drill. Nos. 5 and 6 are 65-in. and 75-in. duplex trimmers for cut sizes. No. 7 is a 95-in. Seybold for skid or carton packing and No. 8 is a new 100-in. Seybold auto spacer trimmer for skids with a radial swinging shuttle table on tracks which services five American Manufacturing Co. hydraulic tables.

Special Quality Control

Random inspections of reams of paper ahead of the trimmers are made



FLOW DIAGRAM of finishing operations.

by inspectors, members of the laboratory test group. The random basis is important, says Hammermill. The inspectors perform the same operation in spot checking reams for count and inspection as do the counter-inspection girls. This quality control inspection provides a measure of the quality level of Hammermill Finishing and gives a measure of the skill of each counter-inspection girl.

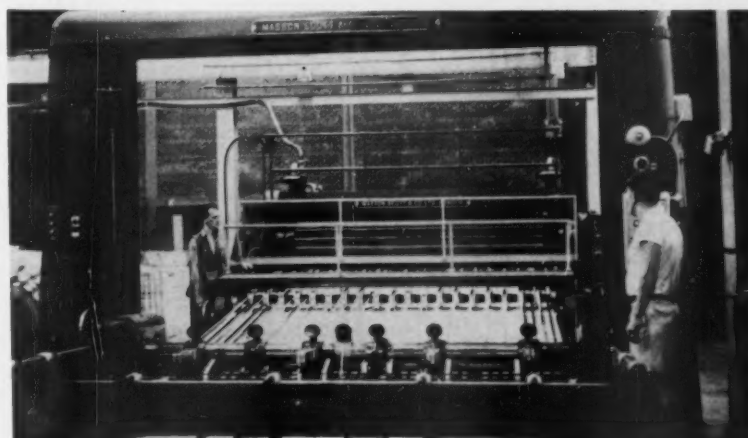
From the trimmer lines, skids move to the ground floor by an elevator. Cartons are fed from the trimmer lines to two lines of Mathews roller conveyors (one line from each end of the trimmer lines). The conveyors have swing arms to turn the cartons around from the trimmer conveyor to the main line and hold arms to prevent cartons from colliding. The two conveyor lines converge into two rubber belt conveyors which move the cartons to the ground floor where they are placed on skids and taken to the warehouse for shipment.

Mezzanine is Unusual

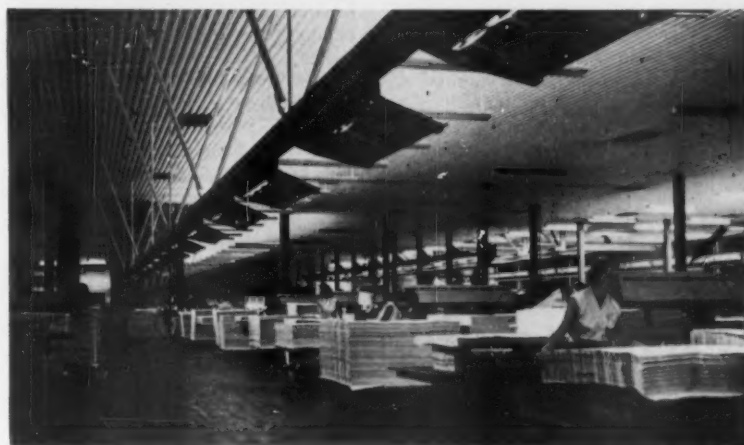
An interesting feature of Hammermill's finishing room is the mezzanine that runs along the west wall above the packaging materials area providing space for locker and rest rooms, offices and a conference room.

Of special interest is the observation gallery with grey tinted glass that runs the length of the mezzanine except for the control offices. The gallery has the dual advantage of offering a good overall view of the operating floor for visitors without the necessity of taking them down through the actual operations and disturbing the operators.

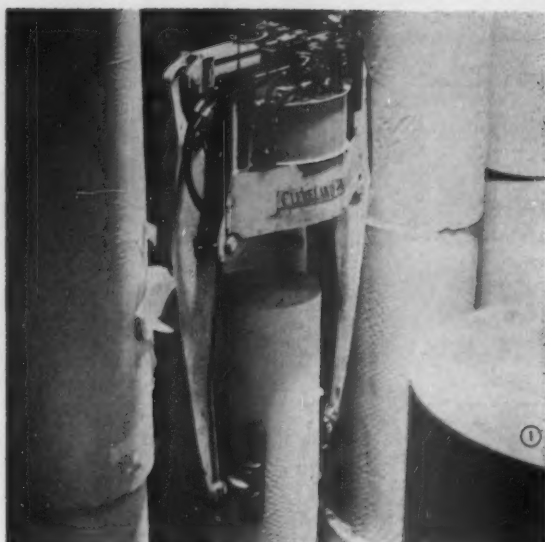
A suspended ceiling of metal construction is used as a plenum for ducts. Grilles in the ceiling provide air exhaust and intake. The entire finishing room area is bathed with fluorescent lighting for uniform brightness.



NEW TYPE SHEETER for U.S. operations is Masson-Scott unit. Special feature is that piler rises with load, eliminating need for a pit or elevator.



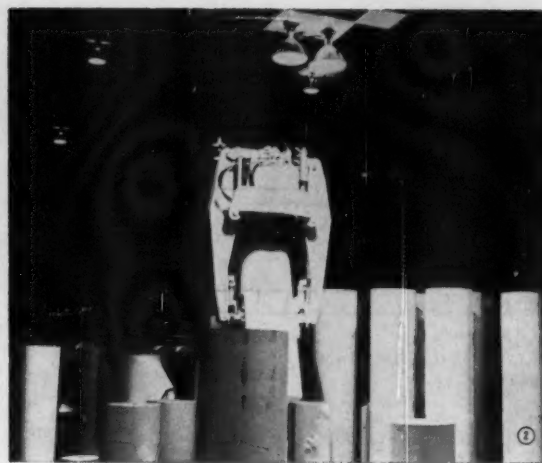
SPECIAL SORTING LIGHTS strike paper at different angles and heights. One set (arrow) strikes sheet at glancing level; other (overhead) at right angles to first.



One man operates the five-ton Cleveland Tramrail system shown in above sequence pictures to store, reclaim and feed rolls to the cutter bays. Base roll storage area is along east wall of finishing building with storage capacity for about five days production or about 2,000 tons.

The single story brick building is 45-ft. high, 304-ft. long and 44-ft. wide. Rolls are fed to the crane by inclined

4. Roll Handling and Storage



ramps at both ends of the storage well. A Hammermill-designed roll indexing system with air-operated pushers, separates the end roll from the group to make it easier for the crane to pick up that roll.

In the roll pit, rolls are stored according to series (note markings on roll end in photo 1). Code system makes it easier to locate roll. The well is divided into 14 east and

\$20,000,000 TO GROW

5. Broke Handling: System is Centralized

Positioned centrally to sources of broke (50% from paper machines, 50% from finishing), broke system is automated and flexible

The collection of broke and its preparation for reuse in the papermaking system is an essential, but usually a difficult operation, with a high degree of manual labor. A number of broke systems were investigated and the best part of the several systems were developed, along with the addition of certain innovations required to meet Hammermill's special conditions, into an efficient broke system requiring the minimum of manpower.

Hammermill's new broke system is centrally located as to sources of broke (50% from finishing and 50% from the paper machines). One man controls:

1. Trim broke from the winders.
2. Trim broke from finishing.
3. Slab broke from the paper machines.
4. Sheeted broke from finishing.
5. Slab broke, cut from rolls by a guillotine.

The new broke system has two Morden stainless steel pulpers, 10-ft. high with a capacity of 2,000 lbs. oven dry (4,000 gal.). The pulpers are of stainless steel construction for

bleaching and wet strength broke pulping. All piping is also stainless steel.

There is an aluminum 42-in high skirt around each pulper. Above each pulper is a Hammermill-designed broke bin, 10-ft. by 10-ft., which holds enough trim broke for a complete pulper charge. Aluminum gates discharge broke into the pulper.

All white trim from the trimmers is collected pneumatically through a duct in the floor under each trimmer. This 14-in. dia. line runs 560 ft. under the main finishing room floor. A gate at each trimmer duct prevents colored broke from entering the air system.

Roll broke is fed to a 5-ft. by 10-ft. hydraulic table. The roll is cut by a slab guillotine and the load is then tilted into the pulper.

The two pulpers will process 100 tpd each. Slushing time, empty to empty, is 20 mins. Bleaching of colored broke takes about 30 to 40 mins. at about 140°F. Hammermill uses calcium hypochlorite and has an ORP unit in each pulper to control the

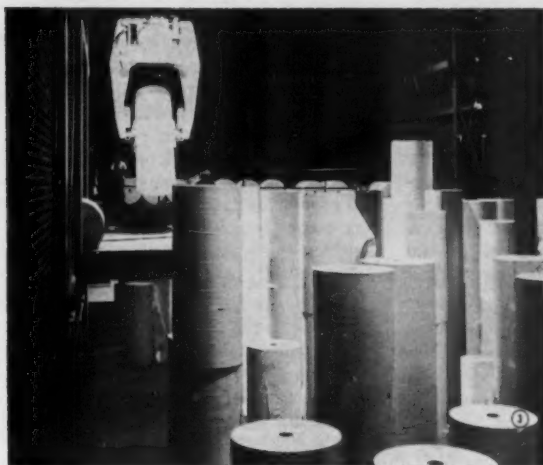
amount of bleach.

Extreme flexibility is built into the broke system. A loop system feeds beaters for six paper machines, bleeding off slush broke pulp where needed. When the pulper cycle is completed, the operator dumps to one of two broke tanks. The tanks are interconnected so that stock can be provided from either in the event of a breakdown or maintenance repairs.

Automatic Controls

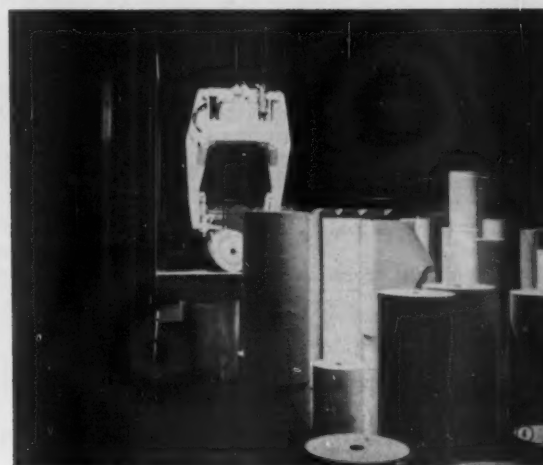
A single panel designed by Minneapolis-Honeywell near the pulpers controls the broke system. From here, sequence buttons are used by the operator for all operations. Sequence buttons control hot water supply valve, hot water supply pump, bin dump, rotor operation, bleach, dump valve, dump pump. Charts indicate water temperature, pulper temperature, bleach level and the amount of anti-chlor added to eliminate residual chlorine after bleaching. Flashers are used for valves and pumps, and broke tank level indicators.

Are Highly Mechanized Operations at Hammermill



west zones. Circles on the well floor guide the crane operator. When the operator stores a roll he marks its position, series number and roll face on an inventory sheet. Every roll has this series and width dimension on its end. The planning department knows where every roll is stored.

Using an instruction sheet as a guide, crane operator retrieves roll from well floor. Note how deftly (photo 1) roll



grab grips roll without disturbing other rolls.

Roll is snaked through towering columns of rolls of paper (2). Spotlights on underside of carriage guide operator. Tramrail moves roll to one of four inclined bays (3) which feed the cutters and then releases (4) roll.

A second Tramrail system on the other side of the wall feeds rolls to the cutter backstands.

6. New Centralized Administration Building



Ultra-modern office building for executive and corporate functions of Hammermill and its subsidiaries supplants older one built in 1905, long since outgrown. Executive functions had been scattered throughout Erie plant area. New T-shaped, air-conditioned building, designed by Daniel, Mann, Johnson & Mendenhall of Los Angeles, Calif., is of aluminum, brick and glass. Windows are of gray-tinted glass to absorb sun's heat. Ceilings have acoustical tile. Floor cell provides flexibility for location of utilities. Office wing is designed for future expansion. Rust Engineering Co. built the building, using largely Erie subcontractors.

7. Power: Boiler Has Electrical Tie-in

Bark and coal are burned on common grate. No new electrical generating equipment added. Water treatment expanded.

A new power boiler is an essential part of Hammermill's growth program to provide steam for the new pulping installation. At first the company considered a separate bark incinerator, but after careful study of several dif-

ferent types of boilers, it decided that the Riley Stoker boiler was the answer to its problems.

A special feature of the new baffleless No. 21 boiler is that it will burn both bark and coal on a common

grate at a 50:50 ratio to produce 25% of Hammermill's steam requirements. The dual rated boiler has a capacity of 206,000 lbs./hr. when burning bark and coal and 230,000 lbs./hr. on coal alone at 675 psi, 760°F.

The boiler is designed to burn unhogged bark, but bark from the new Neutracer woodroom will be hogged before being airconveyed through the 1700-ft. long 14-in. dia. Rader pipeline. Bark will be fed directly into the furnace through a bark proportioner.

Instrumentation on the boiler combustion system by Copes-Vulcan is designed to react to conditions in the coal/bark boiler. The boiler is base loaded and has its own chimney stack, built by Rust chimney division. The increased steam capacity made it necessary to rebuild the boiler feed water treatment plant. The old hot lime-soda-phosphate softener plant did not have the necessary capacities and was replaced with a new hot lime-zeolite plant. This provides feed water for all the boilers.

In the growth program Hammer-

mill did not add any electric generating equipment. The main change to the electrical system was the paralleling with the local utility of its own system and the enlarging of its 13,800 v. distribution system to meet additional loads. These changes made possible the shutting down of inefficient generators in the turbine room.

In order to meet the increased water demands for mill water with the expanded facilities, important additions were made in the treatment plant. A new settling basin identical to the old one was added, doubling settling

capacity. Two new Waco filters were installed to bring filtered water capacity up to anticipated demands.

In addition to the physical equipment, facilities were installed to improve the chemical treatment of the water. During periods of low water temperature it is sometimes very difficult to produce the proper quality water using conventional alum treatment. Equipment has been installed to provide activated silica and Separan as coagulant aids. These have both proven their worth in helping to produce quality water.

New Sulfate Mill Planned as Alaska Pine & Cellulose Becomes Rayonier Canada

Rayonier Canada Ltd., formerly Alaska Pine & Cellulose Ltd., is building a bleached sulfate pulp mill at Woodfibre, B.C., where it once operated a sulfite plant—incidentally one of the oldest in Canada's west coast province.

About \$15,000,000 will be spent on the conversion project, this being in addition to the more than \$20,000,000 that the company has invested since January 1, 1955, on expansion and modernization, principally at its Port Alice mill on Vancouver Is. The Woodfibre mill is located on Howe Sound, about 35 miles north of Vancouver.

Announcement of the Woodfibre program was made by W. E. Breitenbach, president of Rayonier Canada, who informed PULP & PAPER several weeks ago that engineering surveys were being carried out with a view to determining whether the old mill could be converted satisfactorily into a sulfate operation.

The Woodfibre development will be a further step in the integrated utilization of the company's forest resources, according to Mr. Breitenbach, who said that two species, cedar

and fir, previously not used in the company's chemical cellulose mills would add to the wood supply. In addition, chips will be obtained from the company's two large sawmills at New Westminster and Marpole on the Fraser River.

Recovery to Minimize Odors

The present acid plant and equipment and the three original digesters will be demolished and removed. Similar work will be carried out in the unbleached and bleached screen rooms. To replace the facilities being removed, five 12- by 55-ft. digesters and a brown stock washing and screening plant will be built. A 250-ton recovery boiler and multiple-effect evaporators will be installed.

A lime kiln and causticizing plant will also be erected. The chemical recovery system will be designed to minimize the odors characteristic of kraft mill operation. Major changes will be made in the bleach plant, including two additional bleaching stages. Detailed engineering will be carried out by Sandwell & Co., working closely with Rayonier's central engineering div.

Change in the name of Alaska Pine & Cellulose to Rayonier Canada was decided at a special meeting of shareholders. Mr. Breitenbach says that the change was necessitated to avoid confusion in overseas markets. The name Alaska Pine was adopted some 20 years ago to identify and market hemlock, which was not readily saleable at that time.

Founders of the company were Leon and Walter Koerner, who adopted new drying and other processes at sawmills that they acquired. In partnership with Abitibi Power & Paper Co. Ltd., the Koerners purchased the pulp mills of B. C. Pulp & Paper Co. at Port Alice and Woodfibre, which were subsequently taken over by Rayonier, along with the lumber and other operations of the Koerner interests.

Confusion through Translation

Possibility of confusion over names has increased since the entry of two pulp mills into Alaska. One at Sitka, Alaska Lumber & Pulp Co. Inc., is partly financed by Japanese customers of Rayonier, and when translated into Japanese its name is virtually the same as the one by which the B.C. company was known. Also, Mr. Breitenbach explained, the name of Alaska now occupies a more specific geographical meaning in the commercial world because of its recent statehood.

The name Rayonier Canada was chosen because Rayonier Inc. is the principal shareholder, and the Canadian company's manufacturing processes share the benefit of Rayonier's research as well as its marketing facilities.

Although "Alaska pine" is said to be another name for hemlock, in which the Koerners originally specialized, the name was criticized when first adopted because it was felt that it was somewhat misleading. The new name gives a clear indication of the products' Canadian origin, which the old name did not do.



WHERE RAYONIER PLANS EXPANSION . . . Woodfibre pulp mill that dates back to 1910 as one of British Columbia's earliest. The plant is to be converted to a bleached sulfate producer at a cost of about \$15,000,000.

Farthest North Mill Plans

Untapped Finnish forests to supply mill on ice-free Arctic harbor in Norway, near Russia. Free access for Finns by road

(Compiled from special reports to PULP & PAPER INTERNATIONAL from Oslo and Stockholm.)

Norwegian and Finnish government delegations have finished protracted negotiations for a joint project for new industry in the border area between the two countries. The experts have proposed to their governments to build a combined unbleached sulfate pulp and kraft paper mill near Kirkenes, a small Norwegian town on the Arctic Sea, a few miles from the Finnish border and close to the Soviet Union. Probably this new projected mill will be the most northern paper mill in the world as it will be situated at 70° north, a considerable distance north of the arctic polar circle.

As part of the scheme, a sawmill would be built in Finland.

This joint Norwegian-Finnish mill at Kirkenes will have a planned production capacity of 60,000 metric tons a year of pulp and 60,000 metric tons per year of kraft paper (bag paper). It is calculated that the mill will cost 190 million Norwegian kroner or more than \$27 million. This capital investment is to be financed fifty-fifty by the Norwegian and Finnish State. The governments have not yet taken any decisions, neither when the mill will be built nor who will be the principals involved in the project.

Cheap Power

Cheap electrical power for the projected mill will be produced from waterfalls of the Pasvik River on the border between Norway and Russia. The construction of these Norwegian power-stations is based upon a mutual agreement reached between the Norwegian and Russian government a few years ago. The fresh water supply to the mill will be carried through tunnels from Ropel Lake, east of Kirkenes.

The pulpwood resources of the projected mill are situated on the Finnish side of the border in the neighborhood of Lake Enare. Here 1,100,000 hectares of large, but scattered, isolated and old forests are growing, with a calculated average age of 200 years. Total growing stock is estimated at 27 million cubic meters solid volume (about one billion cubic feet) and yearly growth at 470,000 cu. meters solid volume (20 million cubic feet). On account of the great age of

MAP SHOWS SITES for mills, near Russian border along Pasvik River.



the forests, the allowable cut per year is calculated at about 800,000 cu. meters solid volume for the coming 20 years.

Road to Ice-Free Harbor

From Enare the distance is about 450 kilometers to Kemi, the nearest important Finnish export center for forest products, a distance more than the double of that from Enare to Kirkenes in Norway. Furthermore, the harbor of Kemi is blocked five months of the year by ice, while Kirkenes has a good icefree harbor all the year. Therefore, in connection with the paper mill project at Kirkenes, it is planned to construct a high standard road from Enare to Kirkenes. On the Finnish side this road is expected to cost more than \$4 million, while the Norwegian part of the road will cost about \$1,500,000.

The experts recommend that Finland be given right to free transit to Kirkenes.

Transportation will be carried out along the old Petsamo road, which will be elongated 35 km on the Finnish side to join the existing road in the Pasvik valley. On the Norwegian side 18 km of road will be required to join this road with the harbor of Kirkenes.

The raw materials for the sawmill will in this way be transported a maximum of 60 km and the pulpwood about 200 km.

Laplanders and Reindeer

The forests around Lake Enare are practically unexploited. The area is mainly covered by pine. On the other hand the Enare district is very poor in farming land, only 3% of the

area being useful for such purposes. The country is partly inhabited by Laplanders (Lapps) and accommodates some 20,000 reindeer. The district is for these reasons quite poor and unemployment is a problem.

Situated far north on the Scandinavian peninsula, the district belongs climate-wise to the Northern Arctic Sea zone, and hence temperature fluctuations are small although average temperature is low. The northern coast in this region belongs to Norway and has several harbors which are entirely free from ice throughout the year. The lack of communications, another reason for the poverty of this area, has so far made the forest resources worthless.

To fully utilize the forest resources, the proposed sawmill would produce 10,000 standards per year. It has been agreed between Norwegian and Finnish technical committees that the sawmill should be built in Finland at Ivalo near the southern tip of Lake Enare. The sawmill is planned as a complete Finnish enterprise.

As capital is scarce all the investments will probably be made by the governments.

Some technical advantages for the pulp and paper mills are an even supply of raw material throughout the year, a raw material free of fungi attack, a log rich in heart wood and a raw material free of large fluctuations in dimensions and quality.

The plans are still in a state of examination.

The projected mills at Kirkenes will probably give full employment to 250-300 workers, in addition to about 700 loggers and transportation workers.—K. R. S. and O. A.

HOW TO DO IT

Tagging System Aids Safety

Norman Danforth, electrical supt., St. Regis Paper Co's. Buckport, Maine, mill, has devised a tagging system for any electrical apparatus that has to be worked on.

First, the tour electrician on duty is called to open, disconnect the switch or fuse. He installs a red hold tag

which shows the switch number, position the switch is left in (open or closed), whom the apparatus is tagged for and who it is that ordered the disconnect.

Space on the tag is provided for similar information when the circuit is again energized.

ST. REGIS PAPER COMPANY			
BUCKSPORT, MAINE			
SWITCH NO.	OPEN	TAGGED FOR	
	CLOSE		
ORDERS OF	DATE	TIME	A. M. P. M.
TAG TRANSFERRED TO	BY		
TAG REMOVED BY	DATE	TIME	A. M. P. M.
ORDERS OF	OPEN SWITCH LEFT CLOSED		
NATURE OF WORK			
TAGGED BY			
DATE REC'D			
CHECKED BY			

**SEND THIS TAG TO ELECT. SUPT.
WHEN REMOVED**

LOWE

Expansion of Naheola Mill, Marathon Adds 9500 HP

In further expansion of its plant in Naheola, Alabama, the Marathon Southern Corp. will install some 9500 hp of Allis-Chalmers motors as well as rectifiers and a package drive.

The motors will range in ratings from 1 to 1500 hp and will be used to drive refiners, centrifugal pumps, vacuum pumps, a hydro-pulper, fans, and auxiliary equipment.

Where totally-enclosed, fan-cooled motors would normally be required, Super-Seal open type motors with resin encapsulated insulation are being installed. These have a higher service factor than the former and are more economical.

One 20-kw and eight 7½-kw, 250-volt selenium rectifiers will supply excitation current to nine synchronous motors. The package drive is a 40-hp dc adjustable voltage machine.

Alcoa Foil Laminated to Paper Containers

A new development in aluminum foil-laminated containers is being used by Northwest Orient Airlines to ship perishables.

Northwest's Preserv-a-Pak cartons, made by Green Bay Box Co., Green Bay, Wis., utilize Alcoa foil laminated to fiber-board, coated with a special plastic. Florists, meat packers, fish companies, and fresh fruit growers are expected to use the new shipping cartons.

The foil on the outside of the containers reflects heat, allowing contents to stay cold during shipping period. The foil will also reject cold air during winter or at high altitudes.

Inefficiencies of Drying Are Pointed Out By Dr. Whitney, Speaking to Ohio Group

Dr. Roy Whitney, dean of the Institute of Paper Chemistry, told a recent meeting of the Ohio section of TAPPI in Middletown, O., that "drying is one of the neglected operations of the pulp and paper industry."

"In spite of its significance in paper-making, we know very little about it from a quantitative standpoint," he said. "About 50 million tons of both pulp and paper are dried annually in the United States; this is equivalent to 100 million tons of water evaporated or a steam cost of about \$300 to

\$400 million per year. At \$6 to \$8 per ton of paper, this still represents only a few percent of the total cost of paper and perhaps explains in part the relative lack of interest in drying.

"There is a tendency to over-dry paper," continued Dr. Whitney, "which often has detrimental effects on pulp and paper. Drying is essentially an example of simultaneous heat and mass transfer. The problem in drying is basically a lack of understanding of the mechanisms of this operation. Rates are much higher as

compared to air drying, but the rate curves show the same general shapes.

"The studies of hot surface have shown conclusively that in the first period of drying the moisture moves in the direction of the hot surface, he said. "Then vapor at the hot surface begins to travel back through the sheet, passing through capillary tubes that have just been emptied.

"During the initial nearly, constant rate period, vaporization occurs at both surfaces, with much more at the hot surface. Following this there is a rapid decrease in the drying rate as the sheet dries out."

Virgil E. Perry, Harding-Janes Paper Co., is chairman of Ohio TAPPI. The sessions were attended by 178 members and guests.

MUNCHAUSEN STORIES

The Strange Case of How Snafu Paper Co. Went After its Safety Problem

F. P. Hughes of Espanola, Ont., Canada, contributed this story. PULP & PAPER pays \$10 for accepted stories.

It was in that limbo of time between midnight and two a.m. Limbo because the clock strikes once for 12:30, once for 1:00, and once for 1:30, so there is no telling what the time really is.

Over-indulgence, in the shape of an unaccustomed bed-time cup of coffee, kept me tossing and wakeful. Despairing of sleep, I started mentally to review the events of the previous day.

It had started earlier than usual, for I had to take my pair of safety shoes to Rossi's to be half-sole'd and heeled. As I walked on and through the doors of the Spruce, North America, and Forest Union Paper Co., one of the office girls said, "Doc (our technical director) has had a flat and will not be in. Could you look after this morning's conference for him?"

I assented, and entered the library and chatted with some fellow-inmates, until the mill manager walked in. "Where's Doc," he asked.

"Had a flat. He'll be in as soon as he finishes his milk route."

"Our main subject today . . ." started the manager, when the door crashed open, and in strode his assistant, pulling pieces of dried pulp from his coat sleeve.

"Sorry I'm late. I was checking the furnish and stencilling on that Buffalo-Syracuse order." He sat down.

"The compensation board is getting on our tails . . ." started the manager, then interrupted himself and began again. "I think we ought to do something about safety. We're bottom of the list this year . . . Now look at this."

He went over to the stand covered in newsprint, which did duty for a chalkboard, and looked for a crayon. Finding none, he went over to the table drawer and felt in it for one. A moment later he swore and withdrew a hand dripping with blood. Before he could remove the razor blade from the cut, the first-aid class members were swarming over him, holding him

down, washing the wound and bandaging it with a dirty handkerchief.

"It's nothing," said the mill manager when he was released. "Perhaps we'd better walk round the mill and see if we can put our fingers on any trouble spots."

HE LED THE WAY INTO THE MACHINE SHOP . . . His eye caught a man grinding a tool on the grindstone. Walking over, he demanded: "Where is the eyeshield?"

"Fork truck ran over it." Turning to the master mechanic, he asked "Why hasn't it been replaced?"

"We've spent all this year's budget."

"Then put an eyeshield down as your first purchase next year. Your very first purchase, mind."

He walked over to a welder who was struggling with a valve on a gas cylinder. He strained at it, and banged it with his fist. Losing patience at this waste of time, the mill manager said, "Give it to me!" He then took a blowtorch and gently warmed the valve. "Now it'll come easily!" and he turned the valve by hand.

Walking away, he said to the gathering in a low tone "I don't know why these good-for-nothings aren't even interested in learning the tricks of their trade."

"Don't be too hard on them, sir," smirked his assistant, "they haven't the advantage of your intelligence and education, sir."

Turning to the paper mill super the manager snapped, "Look at that broken safety guard! get it replaced immediately!"

A look of happiness lit the super's face and he tripped into his office and snatched up a pad of purchase requi-

sitions and a pencil. He was followed by the mill manager, who stuck his head round the door and bawled, "But don't spend any money!"

A fork truck sped round the corner and neatly knocked the manager's assistant off balance.

"I've never hit anybody coming round this corner before—"

"And you'll not get a chance to again!" He picked himself up and ran down the wide iron stairs towards the personnel office. Half way down he tripped over his shoelace and arrived at the bottom unconscious. A group of laborers ran over to him—this was the bright spot of their day—and one of them felt his pulse. His face fell a little as he said, "No, he's still alive."

The first stretcher cupboard they went to was empty. The stretcher in the second one had a large rip in the canvas and was unusable. At last they got him out of the road on two overcoats and two lengths of water pipe through the sleeves.

A rather subdued little bunch entered the machine room after that. "We seem to have been getting all the bad luck," muttered the manager. "Who's this?"

Running towards us was Doc. His coat was open and his tie flapped in the breeze.

"Come and look!" He pulled the manager by the arm and took him down to the reel of No. 2, bent over and pointed to something. Then Doc's tie caught in a bearing.

Round and round it went, tighter and tighter round Doc's neck. He pulled and screamed, and the manager jerked the clutch out, and in the nick of time a fourth hand slashed the tie off with his knife.

Doc had fainted. Somebody sent me off to get an ambulance.

I looked up at a crane, which was hauling a large girder round. As it towered above me I saw a piece of wire spin off the sling—then another—and another—the sling broke through. . . ! Down came the girder. I squeezed into a niche in the wall. All of me was in except my toes—the girder fell across my feet—my safety shoes were in Rossi's—

CLANG!, CLANG!

Only it was the clock striking two—and I was sitting up in bed, sweating like a cold water line in a machine room.

As I settled down to sleep again I made a mental note to call at the mill store to get a second pair of safety shoes so that I would always have a pair to wear in the mill. Only, I gloomily reflected as I turned over, it was the SNAFU Paper Co., and they wouldn't have my size in stock.

Chicago-Appleton Flights

North Central Airlines now operates two daily round trip Chicago-Appleton, Wis., flights. Stops are made at Milwaukee in both directions. A third Chicago-Appleton flight may be added in the spring. These are in addition to flights to Oshkosh and Green Bay, Wis., from Chicago.

Canadian Firm Leads in Synthetic Vanillin

As the roll drop table lowers (above), a new roll shaft is shown in the hydraulically-operated shaft loader ready to be shifted into position for thread-up by the operator whose hand rests on the pushbutton console. The winder is operating at about 2,600 to 2,700 fpm to suit the 900 fpm of the Fourdrinier. The latter is capable of 1,200 fpm and the winder 3,000 fpm.

Persistent research and aggressive merchandising have placed the Ontario Paper Co. Ltd. mill at Thorold, Ont., Canada, in a position where it

will soon qualify as the world's largest producer of synthetic vanillin, widely used for flavoring.

As a result of recent expansion, Thorold now has an annual vanillin capacity of 1,500,000 lbs. The product is recovered from waste liquor in making sulfite pulp for newsprint.

Ontario Paper has been active in the vanillin field since the early 1940s. Research is now being directed towards other lignin-based products that should reach the market during the next year or so. (In 1943 the com-

pany became the first North American producer of ethyl alcohol from waste sulfite liquor.)

In a steadily-rising world market for vanillin flavoring, the lignin product has become an essential supplementary supply to natural vanilla, which is produced from the vanilla bean. Now most of the major industrial users (manufacturers of ice cream and candy) use vanillin, and the Ontario company has developed substantial sales to the European market.

Howard Smith Paper Mills Ltd., another pioneer in the vanillin field, has been primarily interested in the domestic Canadian market.

Stresses Safety in 49th State

Various departments of Ketchikan Pulp Co., Ketchikan, Alaska, are working up outstanding safety records.

Early this summer the log storage crew completed three years of continuous around-the-clock operation without a lost-time injury. In establishing the record the crew worked 1,095 days (248,294 man-hours).

At about the same time the pulp preparation dept. marked its fourth injury-free year. And three crews in the maintenance dept. have completed five years without disabling injury.

Pulp Tour for Consumers To Southeast Mills

Another "pulp mill tour" is in the works for the Association of Pulp Consumers. The first since the two westward trips a few years ago, this will take members to Union Bag-Camp Paper Corp., Rayonier Inc. (woods operations), St. Marys Kraft Corp., Riegel Carolina Corp. (both woods and mill), and either to Buckeye Cellulose Corp. or Brunswick Pulp & Paper Co. (the party splits for these last two).

Dates will be from Nov. 15 to 19, and the party will base at the Cloister Hotel, Sea Island, Ga., staying there nights, and dinners and other events are scheduled there. A reception and dinner will be held at Sea Island Beach Club on Nov. 16.

Du Pont Expands Plant

Capacity of Du Pont's plant for making methyl methacrylate monomer chemical intermediate for a variety of acrylic plastic and coating resins at Belle, W. Va., will be expanded by 40%.

Orrin G. Youngquist, product manager for "Lucite" acrylic resin, cited coatings as being among the major new markets.

Valley Iron Works Being Acquired by Allis-Chalmers

Plans for acquisition of assets of 60-year-old Valley Iron Works Co. by Allis-Chalmers Manufacturing Co., are announced by R. A. Peterson, president of Valley Iron Works. Directors of both companies have approved. Final approval by the Valley stockholders is expected by about October 30.

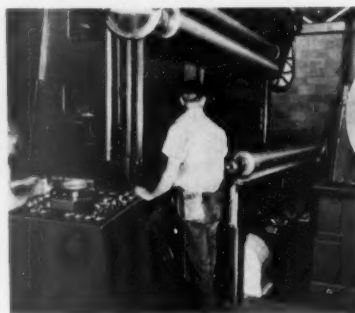
Allis-Chalmers will acquire the business with authorized but unissued common stock. Valley will operate as a wholly-owned subsidiary of Allis-

Chalmers under the name Valley Iron Works Corp. and will continue to manufacture papermaking machinery, according to Mr. Peterson.

"We will continue with the same staff, sales organization and officers," Mr. Peterson said. "The move will strengthen our position in the paper-making industry."

"Allis-Chalmers for many years has manufactured and sold to the paper-making industry electric controls, motors, pumps, chip screens, paper machine drives and other equipment. It developed the hydraulic log barker and was first in the field with this equipment."

"In addition," said Mr. Peterson, "Allis-Chalmers offers to us outstanding engineering talent, as well as research, laboratory and technical assistance."



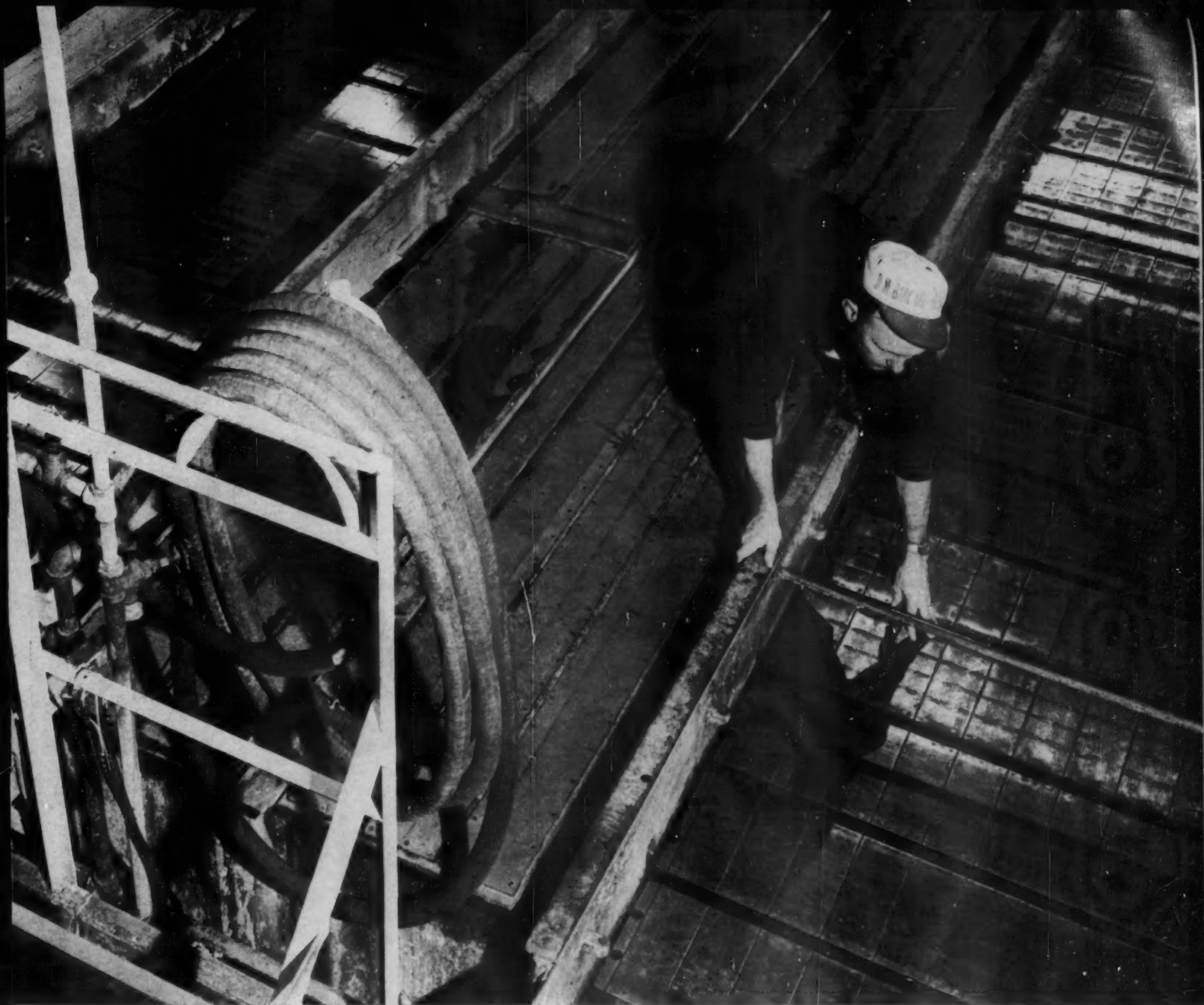
Performing "Satisfactorily" at St. Regis

... in Pensacola, Fla., is this heavy-duty rewind slitter and rewinder, where rolls of desired widths and diameters are produced immediately following No. 1 paper machine. According to company officials, the new Samuel M. Langston Co. unit has thus substantially reduced finishing room operations. A wide variety of paper and board grades is slit and rewound on the 144-in., 72-in. dia. winder. In converting orders at the paper machine, the equipment is handling grades ranging from 40- to 300-lb. (24 x 36-500 basis). The unit slits and rewinds rolls of up to 60 in. in dia. and rolls as narrow as 2% in. (48-in. dia.).

NACE Corrosion Course

The fifth annual corrosion control short course, sponsored by the Houston Section, National Association of Corrosion Engineers, will be held January 22 and 23, at the University of Houston. The course will cover fundamentals of corrosion, cathodic protection, maintenance and operation of corrosion preventive systems, including rectifiers and galvanic anodes. For further information write the chairman, M. A. Riordan, Rio Engineering Co., P.O. Box 6036, Houston 6, Tex.

All available booth space has been taken for the 1960 Corrosion Show to be presented by National Association of Corrosion Engineers, March 15-17, in Dallas, in conjunction with the 16th Annual NACE Conference. For information concerning this and future corrosion shows write R. W. Huff, National Assn. of Corrosion Engineers, 1061 M & M Building, Houston 2, Tex.



Assistant Pulp Mill Superintendent Arthur Hicks inspects one of five Stainless Steel flat screens in the wet room.

Stainless Steel equipment works 24-hour day... still in good condition after five years

AT D. M. BARE PAPER CO., ROARING SPRING, PENNA.

United States Steel Corporation—Pittsburgh
American Steel & Wire—Cleveland
National Tube—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

United States Steel



"I wouldn't describe Stainless Steel as the best material for much of our equipment. I'd go further than that—Stainless Steel is the *only* material that we can logically use," says Mr. Arthur Hicks, Assistant Pulp Superintendent at D. M. Bare Paper Co.

"We paid a little more to install Stainless Steel when our pulp mill opened back in 1954. But now, looking back, we actually saved money because we haven't had to replace the Stainless as we've had to do with other materials. The corrosion resistance, abrasion resistance and strength of Stainless Steel add many years of trouble-free service life. Our Swenson evaporator is a good example. We installed it several years ago to recover

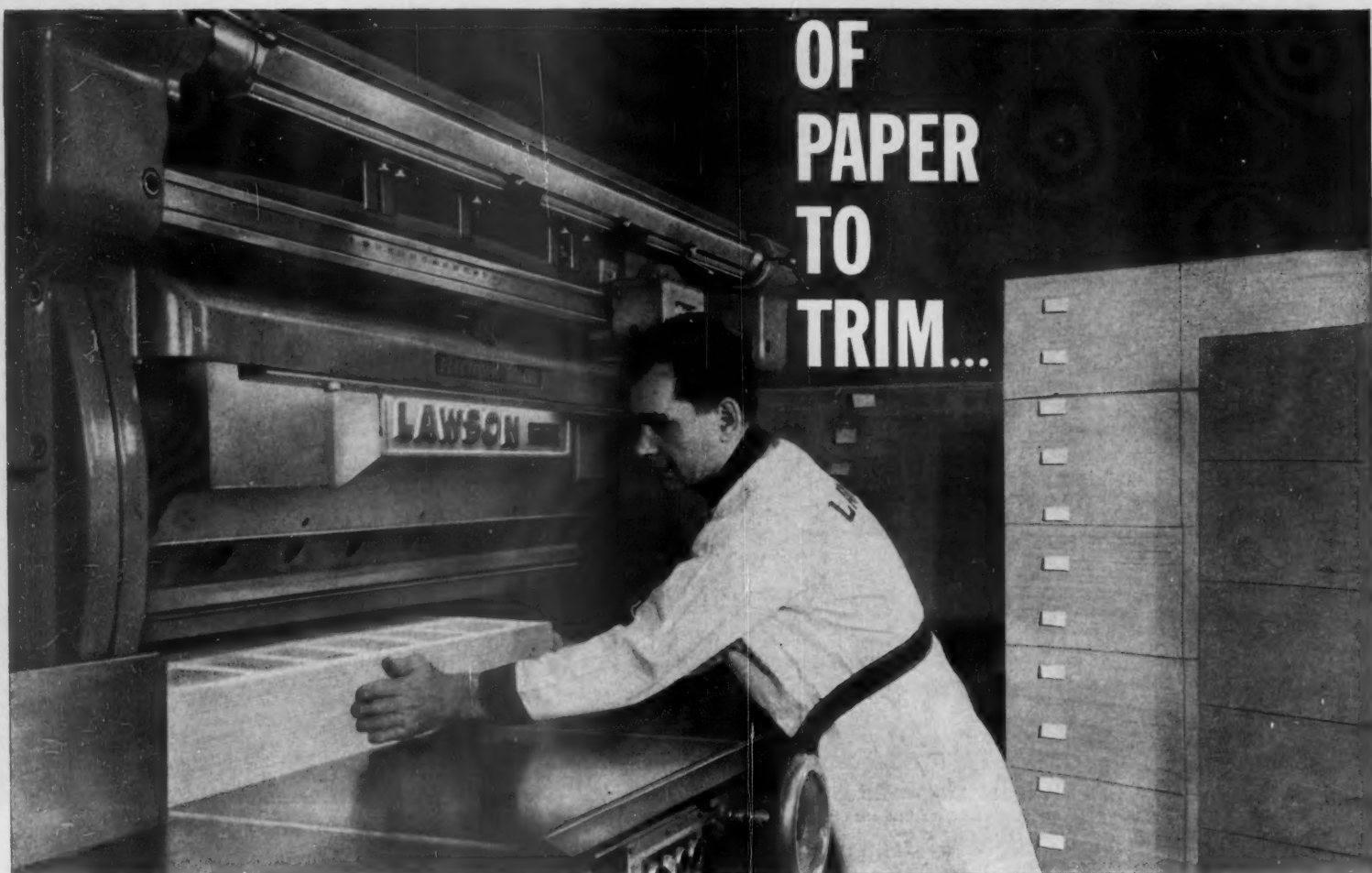
chemicals from cooking liquor. Part of the tubing that *was not* Stainless Steel corroded and had to be replaced. The Stainless hasn't been damaged.

"We installed a lot of Stainless Steel in our bleaching equipment because here, too, we use highly corrosive solutions—acids, chlorine and hydrated lime. This equipment has been working a 24-hour day for five years now, and it's still in excellent condition—better than we had even hoped for."

Build and repair your equipment with Stainless Steel. USS Stainless Steel is available through your U.S. Steel representative or your local Steel Service Center.

USS is a registered trademark

MEN WITH MOUNTAINS OF PAPER TO TRIM...



Rely on big new Lawson Pacemaker Trimmers to do it better

Up to 60% faster and 20% heavier than comparable machines. The new Lawson Pacemaker Hydraulic Clamp Trimmers cut through literally mountains of paper daily...with unmatched accuracy. Easy to operate and maintain.

Electronic Spacer automatically positions the lift with .001" accuracy. Eliminates hand gauging...paces your operator to new production highs.

Adjustable Contour Clamp actually flexes to conform to irregularities in the contour of the pile...assures uniform clamping pressure across the lift. Knife cuts straight and true from top to bottom.

Rear Table Slot Closing Device prevents paper from snagging when rear loading or "swinging" the lift. Built-in air cushion system reduces operator fatigue...means extra production...extra profits.

60"—66"—69"...these big new Lawson Pacemaker Trimmers make all others obsolete. Write or call for full details today.



THE LAWSON COMPANY

DIVISION OF MIEHLE-GOSS-DEXTER, INC.
CHICAGO 8, ILLINOIS

The Beloit Album

NOVEMBER, 1959



TWO PAST PRESIDENTS OF TAPPI recently visited Beloit: G. W. E. Nicholson (*left*) president, Tennessee River Pulp and Paper Co., and K. O. Elderkin (*right*) president, Bowaters Engineering and Development Inc. They are pictured with Beloit's chairman, E. H. Neese. Past, present, and future papermaking techniques were among the topics discussed.



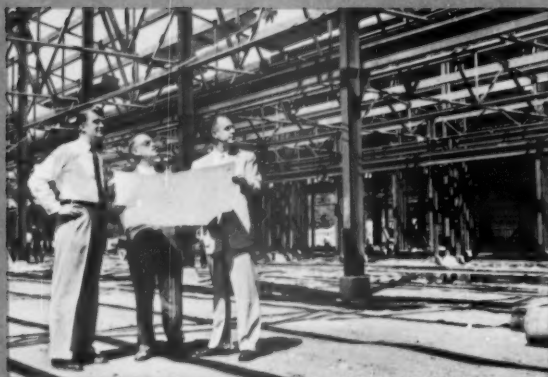
MINNESOTA AND ONTARIO PAPER COMPANY's paper machine superintendent, L. A. Evenson (*l*) and general superintendent, paper, N. L. Jurgensen, hold a discussion beside the new Beloit 158" publication grade machine at International Falls, Minnesota.



THE CRYSTAL TISSUE COMPANY's vice president, manufacturing, John Burdall (*c*) discusses slice assembly on erecting floor with Fay Mills (*l*) and Pete Jerardi, Beloit's Ohio representative.

THAMES BOARD MILLS LTD.'s William King (*c*) and S. J. Wright (*r*) visited Beloit during their recent American tour. Beloit's E.N. Glauner, Jr. reviewed suction roll packing arrangements with them.





CONSTRUCTION PROGRESS at Pittsfield is reviewed in one of the machine shop bays by Jones Corp. executives: (l to r) William Sorenson (Beloit) plant engineer, Dwight Jones, executive v. p., D. W. Curtis, assistant to president.



ROOF TRUSSES frame steelworkers on the new plant scheduled for occupancy in 1960. Shop and erecting bays are high and wide for greatest efficiency. Modern system of fluorescent lighting will illuminate windowless shops.

E. D. JONES CORP., Pittsfield, Massachusetts, adds new products, facilities to "the Beloit Group"



"Turn-key" mills—complete from pulping to finished sets—were made available to Beloit customers last year when E. D. Jones Corp., Pittsfield, Mass., became a member of the Beloit Group. The Jones line of pulp and stock-preparation equipment, in wide use throughout the papermaking world, is now offered in conjunction with the high-speed, high-production paper machinery with which Beloit has equipped leading mills for over a century.

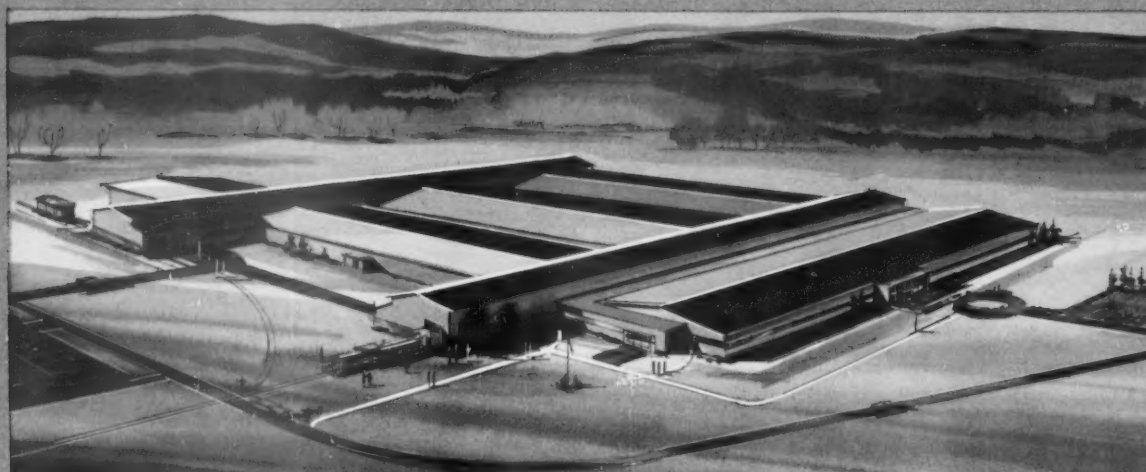
The Jones organization, founded in 1845, is one of the few industrial concerns in the U. S. which has been in continuous operation by the same family for more than 100 years.

Completion of the modern plant at Pittsfield, scheduled for occupancy early in the first quarter of 1960, will double present Jones manufacturing facilities and is expected to quadruple production capacity. Plant area has been engi-

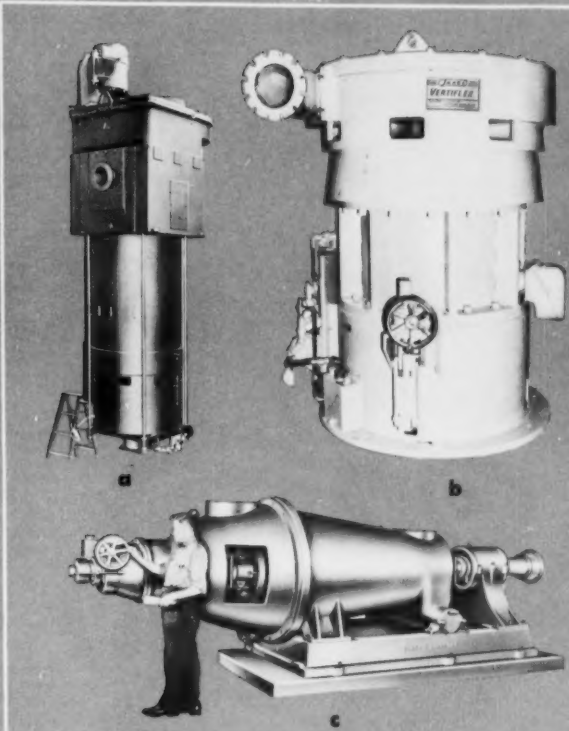
neered to permit future expansion up to 640,000 square feet. Correlated activity of the Beloit and Jones organizations makes the Beloit Group more effective than ever as "your partner in papermaking."

Jones Pulp Mill equipment: Vertiflex chip shredders and primary refiners—Condi continuous digestion systems for all types of pulp—Zenith dewatering presses—Berkshire hot stock refiners—Condi asphalt dispersion systems.

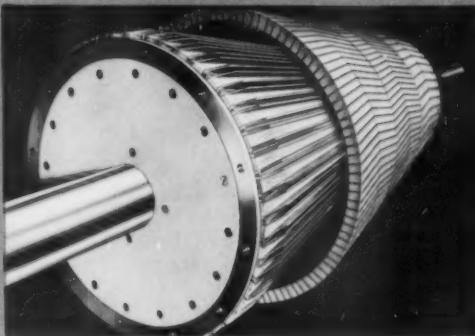
Jones Stock Preparation equipment: Hi-Lo, Pulpmaster, Liebeck and Turboflex pulpers—Jones high-production beating units and washers—Midget, #1, Stockmaster, Fibremaster, Royal, Imperial, Majestic and Leviathan jordan—Berkshire hi-angle conical refiners—Double-D and Vertiflex disc refiners—Jones vacuum and flotation savealls—custom-designed stock chests and agitators.



200,000 SQ FT will be available in E. D. Jones Corp. plant now under construction at Pittsfield. Fabricating and machine shops connect erecting floor (l) with receiving and storage bay (r). Plant has complete rail and truck shipping-receiving facilities. Switch tracks lead directly to main line of New York Central railroad. Massachusetts Turnpike is only a few miles away.



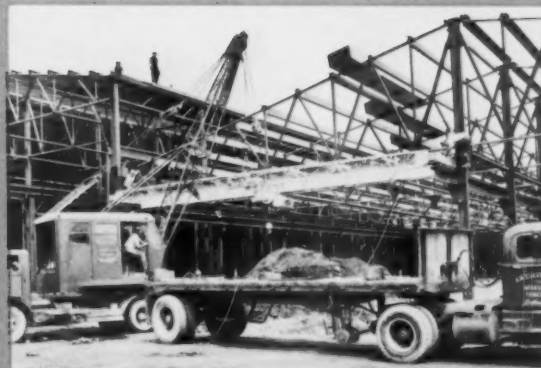
Extensive Jones line of pulp mill equipment and stock preparation machinery includes: a, Zenith 020 de-watering press with floating cone; b, Vertiflex single disc refiner for chip shredding and primary defiber-ing; c, Leviathan Jordan; d, Jones "Adapta-Plug" and "Fulbar" one-piece shell filling.



Jones
PULP MILL EQUIPMENT AND
STOCK PREPARATION MACHINERY



NEARLY COMPLETED HEAVY MACHINE SHOP, with erecting floor footings appearing in the foreground.



BRIDGE CRANE is eased into position in light machine shop. Crane is one of 15 being installed to serve shops.

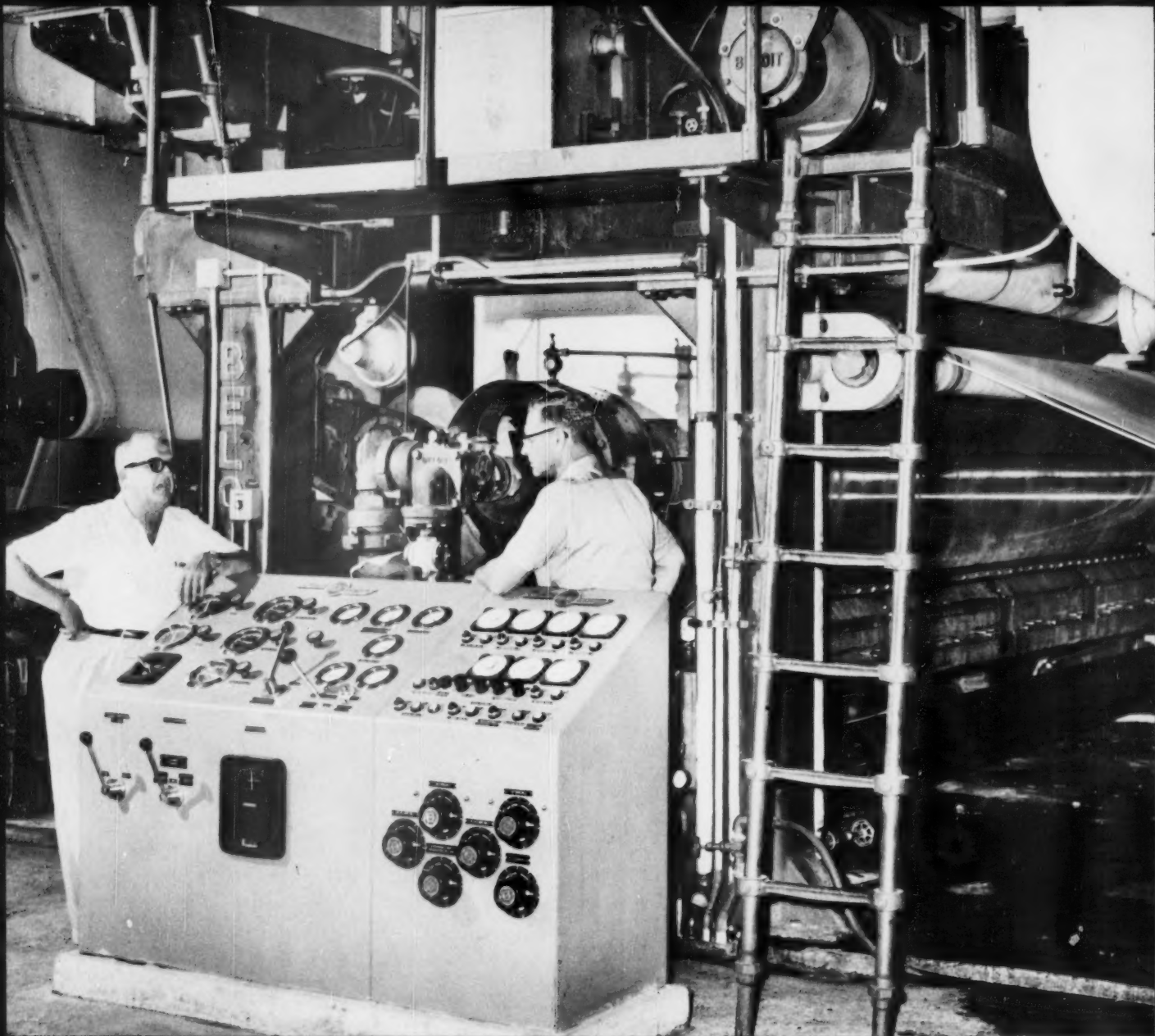


SHIPPING AREA at end of erecting floor takes shape as workmen pour forms. Woodshop will be located to the left.

your partner in papermaking

BELOIT
PAPER MACHINERY





S. R. Christensen.

EXTENSIBLE UNIT, recently installed on #1 machine at International Paper Company's Southern Kraft Division Mill at Camden, Arkansas, produces the dramatic new CLUPAK* papers. Camden mill manager Albert Rozyskie (l) and paper mill superintendent R. M. Miles, are shown at the unit's control console. CLUPAK, Inc. has appointed Beloit to build extensible units under patents owned by CLUPAK, Inc.

Several highly successful commercial installations have been made; additional units are on order. The patented process whereby CLUPAK paper is made brings a new dimension to paper-engineered stress and strain properties. While the process to date has been limited to kraft, principles of manufacture and characteristics are applicable to all grades.

*CLUPAK, Inc.'s trade-mark for extensible paper manufactured under its authority.

your partner in papermaking



WHEN YOU BUY BELOIT . . . YOU BUY MORE THAN A MACHINE

BELOIT

PAPER MACHINERY

Printed in U. S. A.

SERIES 40 GOBBLES UP EXTRA HEAVY CONDENSATE LOADS

This "thirsty" Yarway Impulse Steam Trap gives you all the well-known Yarway advantages like *quick heat-up, even temperatures, small size, good for all pressures, non-freezing*—PLUS the added feature of *huge capacity*.

For example, at 100 psig the $\frac{3}{4}$ " size will handle 5600 lbs/hr; the $2\frac{1}{2}$ " size, 62,000 lbs/hr.

Specify the Yarway Series 40 Trap for applications on large autoclaves, cooking kettles, heat exchangers, heating coils and other places where loads are heavy.

Buy the Yarway Series 40 from your nearby Industrial Distributor—more than 270 stock and sell the Yarway line. Over 1,250,000 Yarway Impulse Steam Traps already sold.

YARNALL-WARING COMPANY
100 Mermaid Ave., Philadelphia 18, Pa.



THE YARWAY FAMILY OF FINE STEAM TRAPS

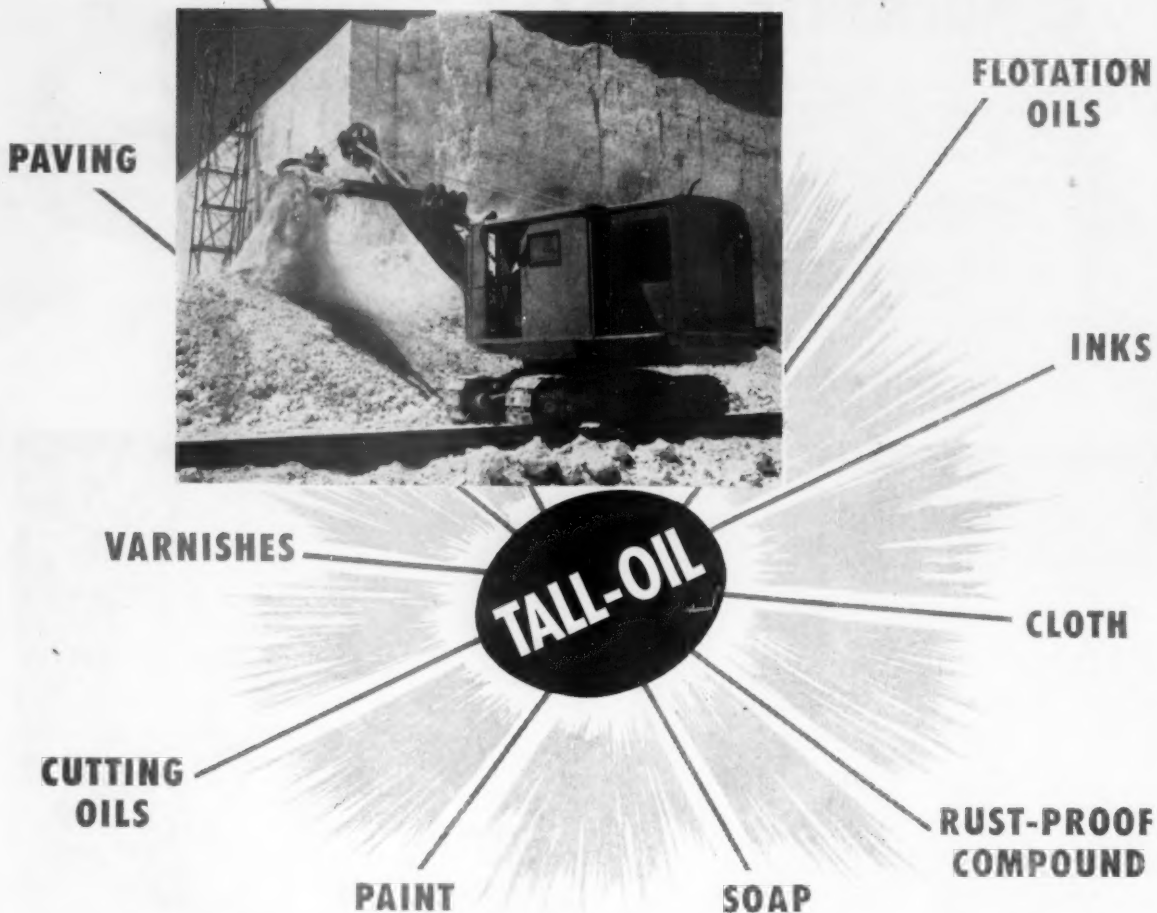


SERIES 60—normal needs, pressures to 400 psi, 6 sizes. **SERIES 120**—normal needs, pressures to 600 psi, 6 sizes. **SERIES 40**—for extra heavy loads, 5 sizes. **NO. 30**—for extra light loads ($\frac{1}{8}$ " only). **INTEGRAL STRAINER**—highest pressures and marine use, 6 sizes.

YARWAY | *impulse® steam traps*

SULPHUR

helps to create **HEADLINE** products



New uses are popping up everyday for this refugee from the skimmings of kraft mill black liquor. Tall Oil is fast becoming the antidote to a lot of supply shortage headaches and cost problems.

Tall Oil is extracted from black liquor skimmings with the aid of sulphuric acid. Some interesting experiments in connection with

the refining of Tall Oil involve the use of sulphuric acid at subzero (centigrade) temperatures. Most applications of sulphuric acid are at room temperature or higher.

Here is a relatively new product, certainly a 'headline' product, and it requires a derivative of Sulphur in the reactions that make it!

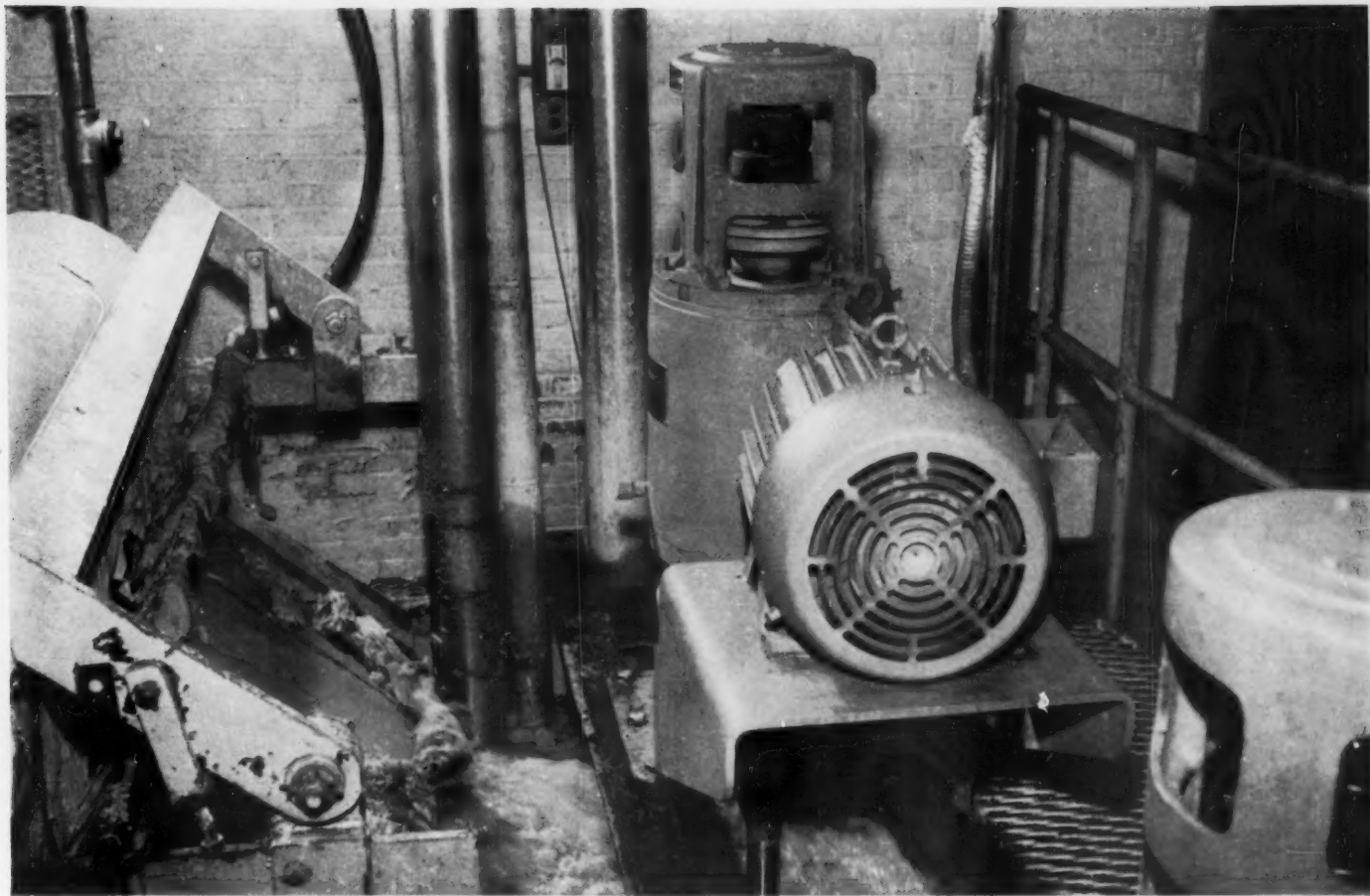


Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N. Y.
811 Rusk Avenue, Houston 2, Texas

Sulphur Producing Units

- Newgulf, Texas
- Moss Bluff, Texas
- Fennett, Texas
- Spindletop, Texas
- Worland, Wyoming
- Okotoks, Alberta, Canada



Controlled turbulence created by LIGHTNIN Stock Agitator rapidly separates stock fibers at Gould Paper Co., Lyons Falls, N. Y.

How to make stock uniformity toe the mark

This repulping system gives the mill a tight rein on stock consistency and pH.

Here you see step one. Hardwood stock at a soggy 12% consistency drops from the washers into both ends of a 32-foot-long dilution chest. The tiled chest is 4 feet wide and carries a 4-foot stock level.

Incoming stock meets a stream of acid water recycled from the secondary washer. In each 6-foot-long end section of the chest, the turbine on a 15-hp LIGHTNIN Stock Agitator drives stock and water in a powerful mixing flow.

With this kind of agitation, fiber

length and freeness are essentially unchanged. Controlled turbulence does the work of separating the fibers.

Consistency anywhere in this part of the chest stays within 0.1% (bone dry) of the average. Retention time is four minutes.

Rapid pH control Next, uniform stock tumbles over a weir into the 20-foot-long center zone of the chest. Here two more LIGHTNIN Agitators rapidly disperse strong sulfuric acid to bring pH to 2.5 and hold it there as stock discharges to the secondary washer. Uniform consistency and acid-

ity are provided at all conditions up to the design maximum of 4.0% (b.d.).

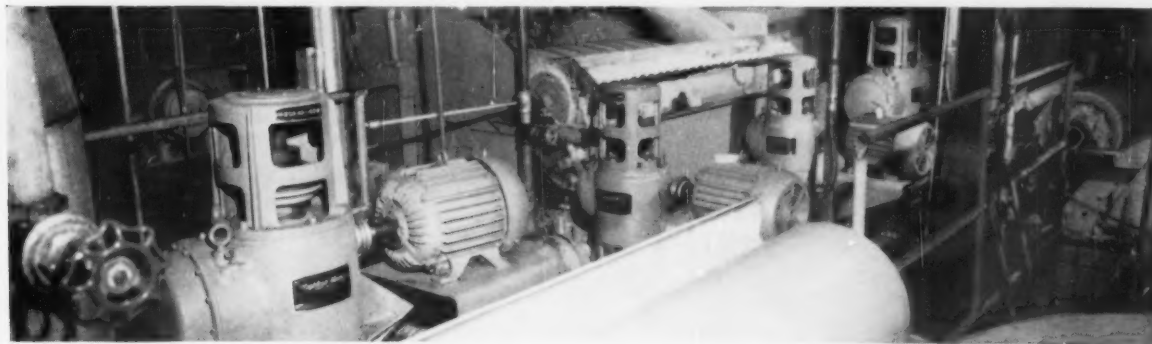
This MIXCO-designed system was delivered to the mill just five weeks after the day it was ordered. It is only one example of the precision control you can bring into your pulping and paper-making operations with LIGHTNIN Agitators in your chests.

To find out more about this kind of mixing and the guaranteed results it gives you, call in your LIGHTNIN representative now. His name is in Thomas' Register and in the yellow pages of your phone directory. Or write us.

MIXING EQUIPMENT Co., Inc., 141-m Mt. Read Blvd., Rochester 3, N. Y.
In Canada: Greer Mixing Equipment, Ltd., 100 Miranda Ave., Toronto 19, Ont.

Lightnin Mixers
MIXCO fluid mixing specialists

Dilution chest has repulp sections at ends, pH-control section in center. Installation adapts easily to changes in mill requirements.





pick
a
pulp

and Mead's got it!

Chemical or mechanical, hardwood or softwood pulp — whatever you select — you can get it from Mead Pulp Sales.

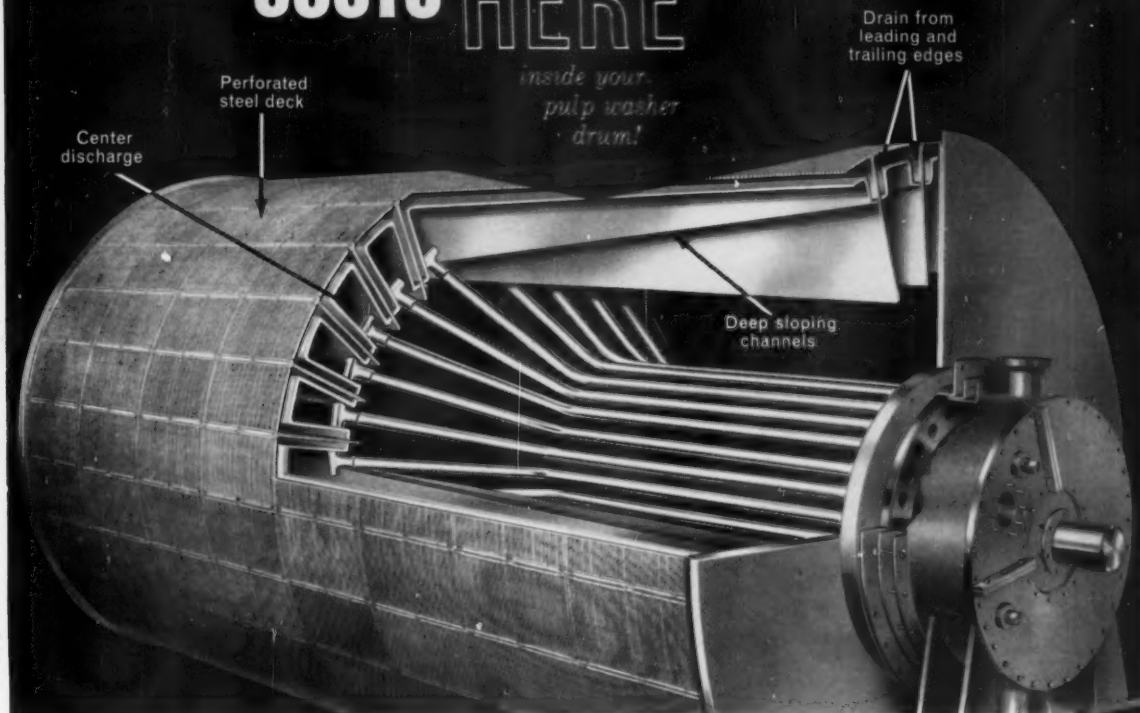
Multi-million dollar research facilities assure you of unvarying quality that meets or exceeds any standard. Delivery is prompt and sure because the eight pulp mills represented by Mead Pulp Sales have huge forest reserves that provide a constant supply.

For further information, contact the Mead Pulp Sales office nearest you. One of their representatives will be glad to tell you about all the advantages you get when you order Mead Pulp.

MEAD
pulp

MEAD PULPSALES, INC. • Dayton 2, Ohio
Distributors of Bleached and Unbleached, Chemical and Mechanical Wood Pulp; Fiberglass Paper Machine Hoods and Allied Equipment.

YOU CUT EVAPORATOR COSTS HERE



A better hydraulic system resulting in more effective use of drum surface is the principal reason why Swenson pulp washers require less dilution to obtain clean pulp. And lower dilution means lower evaporator costs.

Swenson pulp washers pick up a thicker sheet of pulp, permitting lower drum speeds and greater drainage time. The patented Swenson channels are sloped to the center with liquor drainage on both the leading and trailing sides. These features provide the most effective use of the drum area assuring low dilution operation.

SEND for more FACTS on the cost-cutting Swenson pulp washer. Write for bulletin E-108, "Pulp Mill Equipment," today. Swenson Evaporator Company, 15632 Lathrop Avenue, Harvey, Illinois



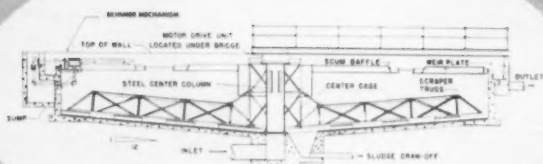
PROVED ENGINEERING FOR THE PROCESS INDUSTRIES SINCE 1889

SWENSON



WHITING—MANUFACTURERS OF CRANES; TRAMBEAM HANDLING SYSTEMS; TRACKMOBILES; FOUNDRY AND RAILROAD EQUIPMENT.

Choose the CORRECT WASTE TREATING EQUIPMENT for SUSPENDED SOLIDS REMOVAL



If you require only settleable solids removal you'll do well to consider an INFILCO clarifier for simple gravity settling. Correct hydraulic and mechanical design insures satisfactory performance and minimum maintenance expense.

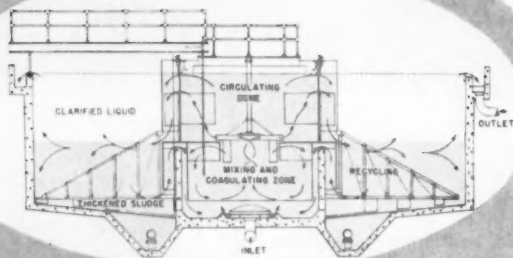
The WS Clarifier mechanism with a central drive shaft supported from stationary beams spanning the tank is available for small and medium diameter units. The BF mechanism with the scraper assembly suspended from a turn-table carried by a central column is preferred for larger size clarifiers.

Surface skimmers are available for floatable solids.

For complete information, send for

Bulletin W-800-D

Minimize your investment by selecting the correct equipment to accomplish the results you want



If pollution control regulations or your plans for water recovery require colloidal as well as settleable solids removal by chemical coagulation, specify the CYCLATOR® clarifier to obtain unique design features which give you maximum clarification.

Untreated waste and chemicals are mixed in the presence of previously precipitated solids which are recirculated from the settling zone. This promotes formation of large dense floc particles which settle rapidly and produce maximum clarification.

Bottom scrapers thicken settled sludge and move it to the discharge sump. Surface skimmers are available for floatable solids.

For more complete information, write for

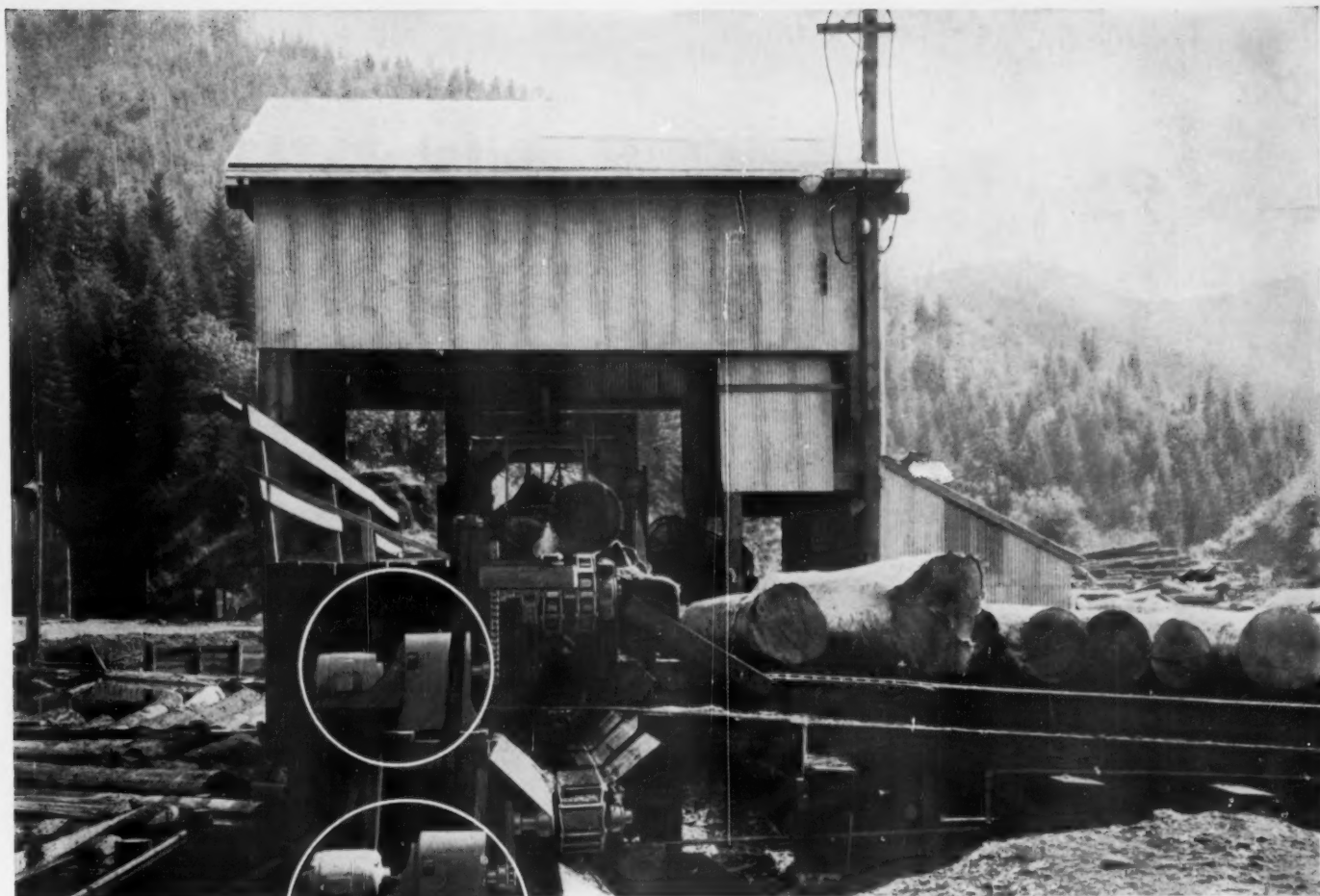
Bulletin 850-C



INFILCO Incorporated

General offices • Tucson, Arizona

Field offices throughout the United States and other countries



FALK Motoreducers driving log conveyor and refuse conveyor at the modern mill of The Bohemia Lumber Company, Culp Creek, Oregon.

FALK all-steel Motoreducers give you longer service life

Whether your load conditions are normal or heavy, the extra rigidity of all-steel construction (more than twice that of cast iron) maintains better alignment of revolving elements under load...a vital factor in prolonging the service life of gears and bearings.

And if your installations are subject to shock loads, or accidental external impacts, you're way ahead when you install Falk All-Steel Motoreducers. These rugged units do not destroy themselves by tearing off their feet under jamming overloads, nor are their housings subject to cracks which both dissipate the vital lubricant supply and allow revolving elements to get out of alignment.

All-steel construction is one of the built-in extras that you get in Falk Motoreducers. Others include: (1) 12 to 15% reserve load-carrying capacity in the gears (by AGMA standards), thanks to exclusive Falk extra-depth, high pressure angle helical gears; (2) maximum mechanical efficiency (98½% per gear mesh, under full load); (3) your choice of standard units (horizontal, vertical or right angle) to fit your precise requirements.

HORSEPOWER RANGE: to 75 hp . . . **STANDARD OUTPUT SPEEDS:** 780 rpm (high) to 1.2 rpm (low).

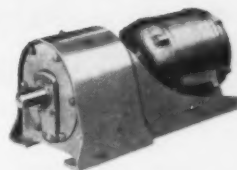
Prompt delivery from distributor stocks, or from warehouse or factory. Ask your Falk Representative or Authorized Falk Distributor for **Bulletin 3100**.

THE FALK CORPORATION, MILWAUKEE 1, WIS.

MANUFACTURERS OF QUALITY GEAR DRIVES AND FLEXIBLE SHAFT COUPLINGS

Representatives and Distributors in most principal cities

Take your choice of all-steel drives when you specify Falk



THE FALK ALL-MOTOR MOTOREDUCER

...the original All-Motor unit



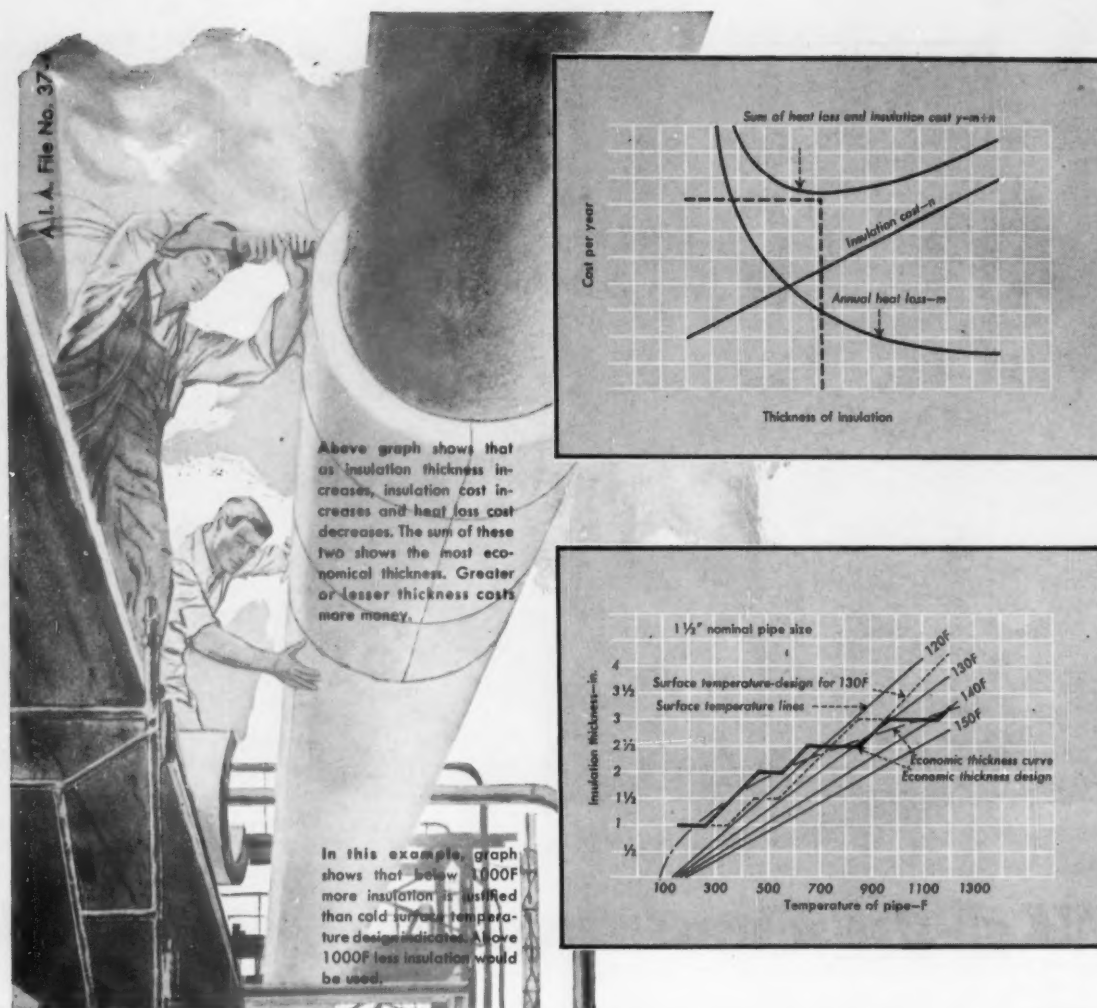
THE ALL-STEEL FALK SHAFT MOUNTED DRIVE

Torque ratings to 41,000 lb-in at low speed shaft. Also available in flange-mount design.

FALK and ALL-MOTOR are Registered Trademarks.

FALK

... a good name
in industry



"COLD SURFACE" CRITERION WASTES MONEY!

How J-M engineers determine economic insulation thickness

to give you more for your insulation dollar

OVER-ALL cost of the operation should always be the determining factor in selecting insulation thickness. Yet, millions of dollars have been wasted because of rigid adherence to the cold surface temperature method. When Johns-Manville insulation is applied, J-M engineers carefully determine which thickness will provide the greatest operational savings. And this "economic thickness" is usually more (or less) than the cold surface method indicates.

Here's how it works. The annual cost of the heat loss through the insulation is plotted for various thicknesses. Also plotted is the annual cost of insulation. A third curve is then drawn as the sum of heat loss and insulation cost. The economical thickness is found where this third curve reaches its lowest point.

To arrive at the above figures in a given instance requires the following: 1. Cost of heat production per million Btu; 2. Rate of heat loss through insulation in

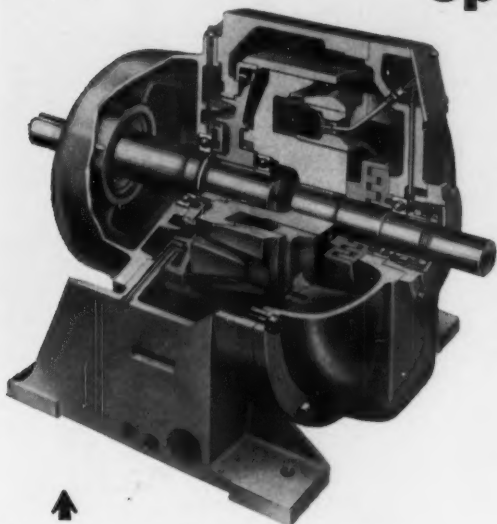
Btu per unit area per hr; 3. Annual hours of operation; 4. Applied cost of insulation per unit area; 5. Rate of amortization and required return on the insulation investment cost. Items 2 and 4 are available from the insulation manufacturer; others are normally supplied by the plant engineer.

For more complete information, call or write Johns-Manville, Box 14, New York 16, New York. In Canada, Port Credit, Ontario. Ask for reprint of technical article "Select Economic Insulation Thickness."

JOHNS-MANVILLE



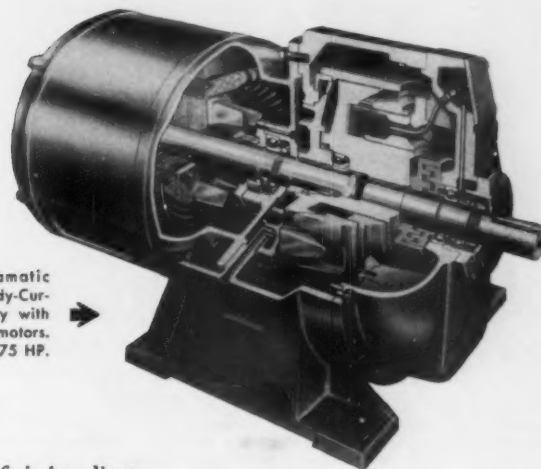
The **BEST** Solution to Difficult Speed Control Problems—



Dynamatic Liquid-Cooled Couplings provide infinitely adjustable speeds for nearly every application from 3 to 75 HP. Note the absence of slip rings, brushes, and commutators. Heavy-duty types with capacities up to 5,000 HP are also available.

EATON
DYNAMATIC

**LIQUID-COOLED EDDY-CURRENT
COUPLINGS and DRIVES**



"Dynaspede" Drives are Dynamatic Liquid-Cooled, Stationary-Field Eddy-Current Couplings mounted integrally with standard, D-flange, squirrel cage motors. Available in capacities from 3 to 75 HP.

Here's Why—

Dynamatic Liquid-Cooled Couplings and Drives provide infinitely adjustable speed from a constant speed source—or constant speed from a variable speed source. They operate on standard alternating current. Rotary power is transmitted through the coupling by an electromagnetic reaction between the driving and driven members of the unit—there is no mechanical contact of rotating members to cause wear and require adjustment or replacement.

A wide range of standard and special control features may be obtained from a remotely-mounted electronic control system. Infinite speed adjustment, constant speed control, on-off clutch control, torque limit, acceleration control, inching, and threading are a few of the many functions available. The addition of an eddy-current brake to standard couplings or drives provides smooth, cushioned stops and controlled deceleration.

Liquid-Cooled Dynamatic Couplings and Drives deliver more horsepower than other types of the same physical size, thus conserving space in a busy machine area. Efficient heat dissipation permits continued operation at low speeds, or stall with full load.

Completely enclosed, Dynamatic liquid-cooled units are protected from dust, dirt, and other atmospheric impurities. Dynamatic design involves no brushes or slip rings; there is no possibility of arcing. With simple modification these units can be made explosion-resistant for hazardous applications.

**Infinitely Adjustable Speeds
from AC Power**



Full-Torque Starts



Wide Range of Control Functions



**No Slip Rings, Brushes
or Commutators**



Completely Enclosed Design



Low-Cost Maintenance



Send for Our New Illustrated Bulletin.

EATON

**— DYNAMATIC DIVISION —
MANUFACTURING COMPANY**

3307 FOURTEENTH AVENUE • KENOSHA, WISCONSIN



"ICEBERG" and "ICECAP K" PIGMENTS

DOLLAR SAVINGS BY USING ANHYDROUS ALUMINUM SILICATES (Kaolin Type Clay) Replacing TiO_2

By using approximately three pounds of ICEBERG or ICECAP K pigment to replace one pound of TiO_2 , the following saving can be realized. It is important to keep the ash content the same by cutting back on other fillers such as coating clay or filler clay when increasing the amount of brightening filler.

SAVING PER POUND TiO_2 ELIMINATED			
Approximate Delivered Cost Per Pound			
Burgess "Iceberg" Pigment . . . .	.032¢	Coating Clay . . . . .	.017¢
Burgess "Icecap K" Pigment . . . .	.04¢	TiO_2 . . . . .	.27¢
COST			
ITEM	"Iceberg"	"Icecap K"	
Burgess Products (3 lbs.) . . . . .	.096¢	.120¢	
Total Cost . . . . .	.096¢	.120¢	
TiO_2 (1 lb. eliminated) . . . . .	.270¢	.270¢	
Coating Clay (eliminated 2 lbs) . . . . .	.034¢	.034¢	
Total Eliminated . . . . .	.304¢	.304¢	
TOTAL SAVINGS			
(for every lb. of TiO_2 eliminated) . . . . .	.208¢	.184¢	

Write for working samples and prices

Low Cost

Brightening Agents

Replace costly white pigments in—

- Bleached manila lined board
- White patent coated board
- Ground wood and/or sulphite furnishings

Burgess Pigment COMPANY

Mines and Plants: Sandersville, Georgia

EXECUTIVE SALES OFFICES: P. O. BOX 145, SANDERSVILLE, GA.

Warehouses: Jersey City N. J.; Saylesville, R. I.

- HYDROUS AND ANHYDROUS ALUMINUM SILICATE PIGMENTS
- KAOLIN CLAYS

Clark-Aiken MACHINERY

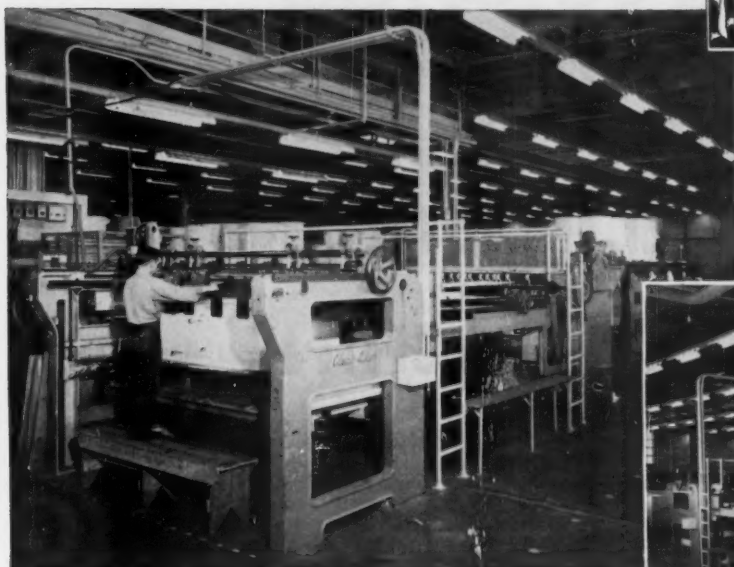
sets the pace at



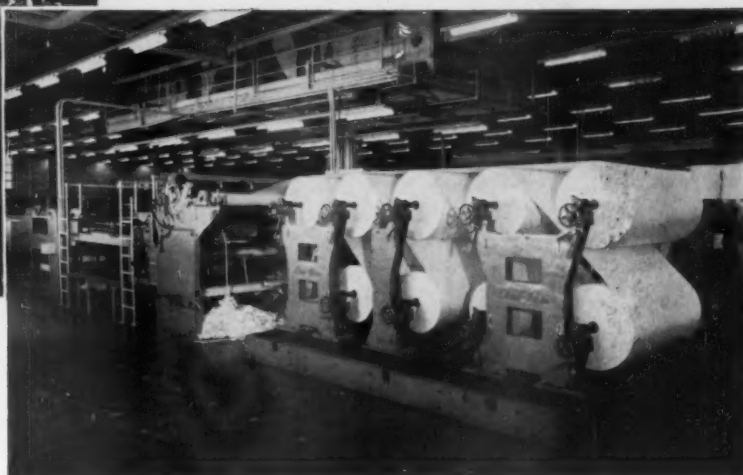
Bergstrom

PAPER COMPANY

NEENAH, WISCONSIN



CLARK-AIKEN machinery . . . engineered to meet today's finishing room requirements . . . is your guarantee of greater production, lower costs and uniformly high quality!



Place your finishing room production problems in the hands of Clark-Aiken engineers with complete confidence. Realize important savings and improve your competitive position through a practical automated operation based on the latest operating techniques and up-to-date machinery. Maintain quality with modern equipment that is geared to deliver top production around-the-clock. Clark-Aiken equipment coupled with Clark-Aiken engineering to individual requirements assures you better control of **your** finishing room production. Whatever your finishing room problem may be — consult Clark-Aiken for prompt and interested consideration.

Mr. Lawrence J. Zielinski, finishing operations supervisor and Mr. Walter Akstulewicz, sheeting department supervisor, Bergstrom Paper Company, Neenah, Wisconsin have this to say about their Clark-Aiken sheeters:

. . . "Our two Clark-Aiken sheeters operate at varying speeds providing efficient sheeting performance with a minimum amount of maintenance."

THE
Clark-Aiken
COMPANY

957 SPRINGFIELD ROAD

LEE, MASSACHUSETTS

IMPCO OFFERS COMPLETE BROKE PULPING AT ALL POSITIONS ON YOUR PAPER MACHINE

Over two thousand Impco Agitators for every conceivable mill requirement, both before and after the paper machine, are in successful operation. As a pioneer in the designing of such equipment, Impco also regularly builds broke handling devices for various positions under the paper machine. Consequently, such units as Couch Pit Agitators, Sheet and Roped Press Broke Shredders, Dry Sheet Shredders, Solvo Pulpers and Defiberers have been developed. As a result of this mill proven experience, Impco can provide you with either a complete broke handling system or individual components.



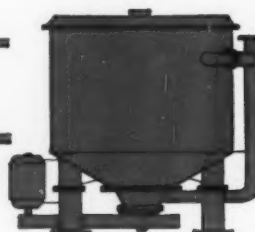
Press Broke
Shredder



Weedless Repulper



Dry Sheet Shredder



Solvo Pulper



**IMPROVED
MACHINERY INC.**
NASHUA, NEW HAMPSHIRE

In Canada, Sherbrooke Machineries Limited, Sherbrooke, Quebec

Thiele Kaolin



SUPERIOR CLAYS for FILLING or PAPER COATING

- Controlled Particle Size • Excellent Color
- Standardized Low Viscosity • High Brightness

Thiele Water-Washed Clays are mined from vast holdings in the heart of Georgia's clay belt, carefully tested and controlled while being processed at Thiele's modern plant. Two spray drying plants assure coating clays that will provide EASIER MAKE-DOWN—IMPROVED HANDLING—LOWER MOISTURE CONTENT—MORE UNIFORMITY.

Illustrations show particle size testing and core testing—in Thiele laboratory.

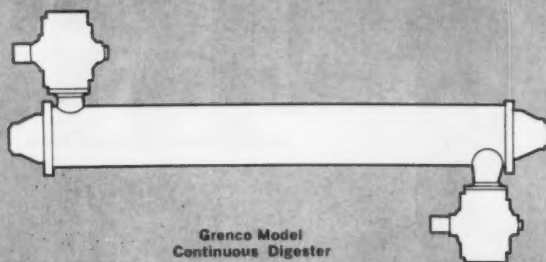
Write for full information and sample of Thiele Kaolin Coating or Filler Clay for your particular use.

Thiele Kaolin Company

P. O. BOX 270 • SANDERSVILLE, GA.



Rapid Cycle
Batch Cooker



Grencro Model
Continuous Digester

Bauer

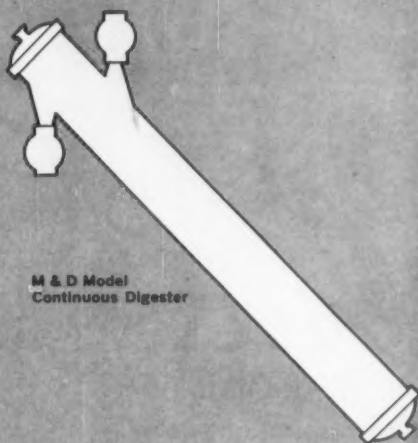
DIGESTERS

**A Complete Line for
All Cooking Requirements**

Bauer's modern line of digestion equipment is engineered specifically to help you meet modern market demands.

Featuring automatic operation, accurate control and high efficiency, this equipment includes the Rapid Cycle batch cooker and two types of continuous digesters—the Bauer M & D model and the Bauer-Grencro model. Both continuous models are equipped with the famous Bauer-Grencro rotary valve. Optional electronic controls assure maximum uniformity in any type process.

Bauer is the only supplier that can offer you, on an impartial basis, the type digestion equipment best suited to your particular needs. For more details, ask for Bulletin P-30.



M & D Model
Continuous Digester



Grencro Rotary Valve
for Continuous Digesters



Electronic Controls (Optional)



THE BAUER BROS. CO.

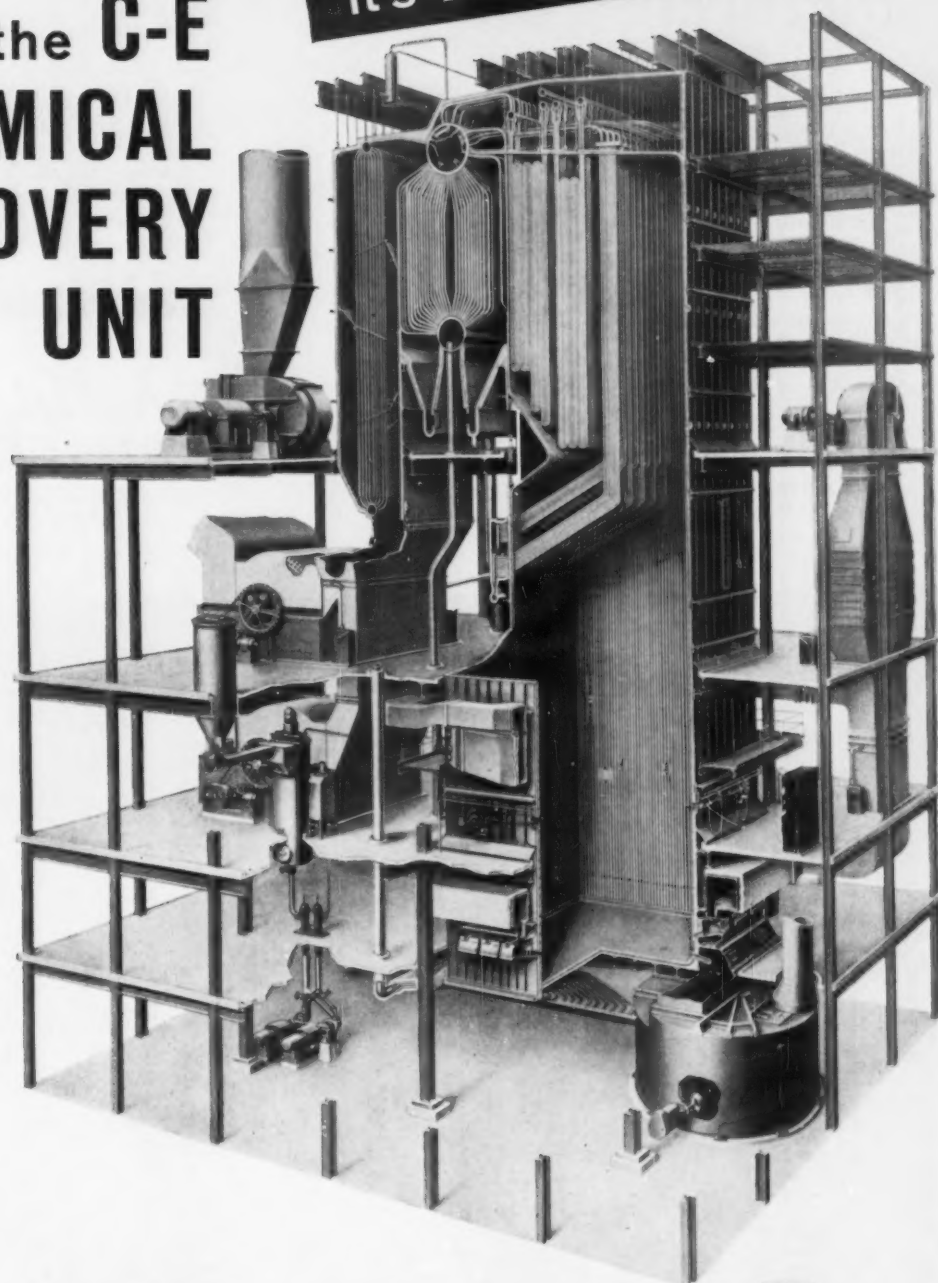
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SPRINGFIELD, OHIO

It's RELIABLE...

It's FLEXIBLE...

It's EASY to operate...

It's the C-E CHEMICAL RECOVERY UNIT



COMBUSTION ENGINEERING

Combustion Engineering Building
200 Madison Avenue, New York 16, N. Y.



ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; POLYMERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIPE

Now...A Packless Metering Pump*

ACCURACY! ECONOMY! DEPENDABILITY!
Proven Masterline Design!
Eliminate Costly Down Time and Maintenance with These Unique Features

- Packless Liquid End Construction
- Flooded Suction Not Required
- Constant Volumetric Displacement
- Design Eliminates Entrained Air On Hydraulic Side
- Built-in Safety Relief Valve
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- Plus All Regular Masterline Features: Simplified crank drive, pre-tested accuracy, sturdy construction, separate motor and speed reducer, adaptable for automatic or remote control . . . everything to insure dependable operation at lowest maintenance cost.

*PATS. APPL. FOR

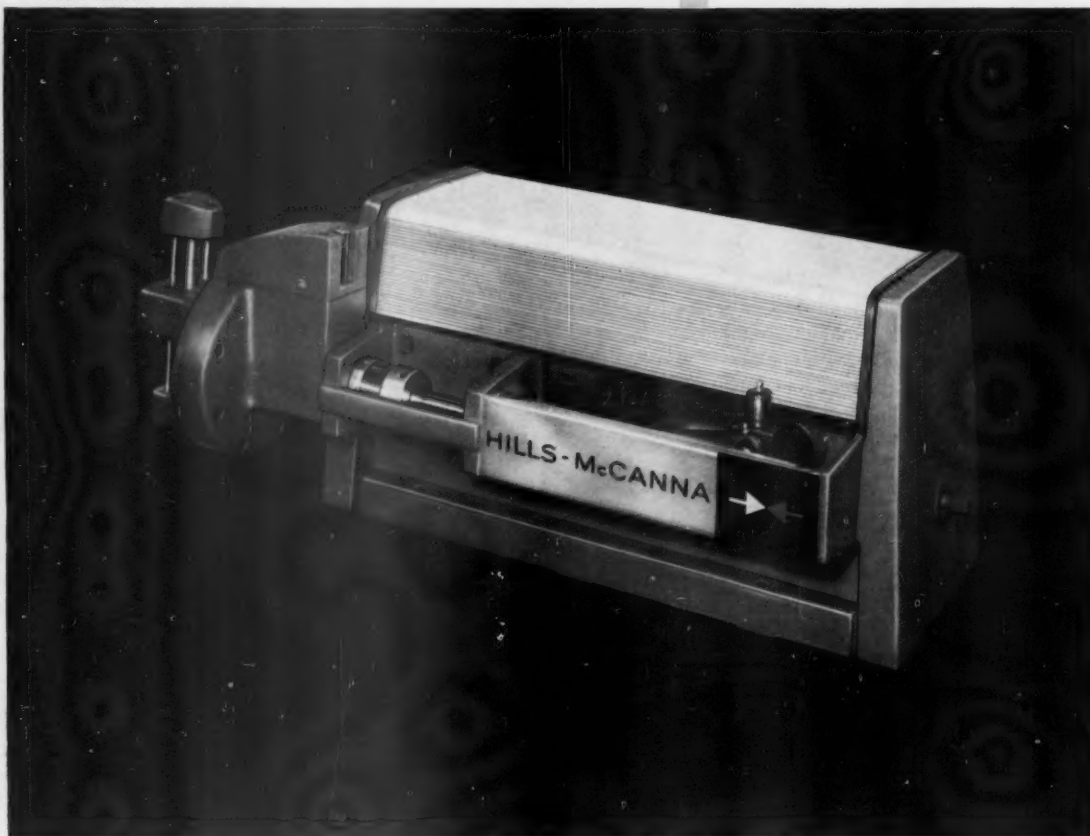


SEND for our new specification sheet with full data on the Masterline Packless Metering Pump #903

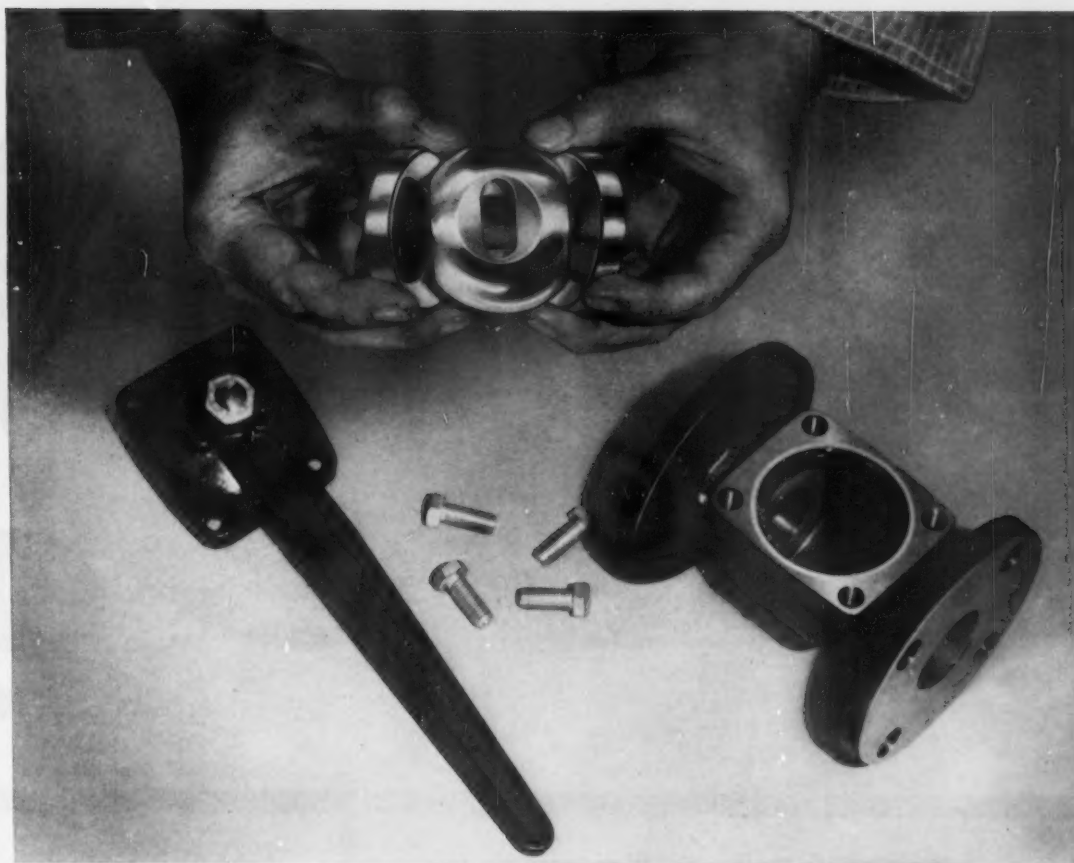
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Now a BALL VALVE* with all the features you've wanted

Thirty years of leadership in valve manufacture now brings you the Hills-McCanna Ball Valve! It offers every advanced feature to help you cut costs, step up production, reduce maintenance, and improve product quality.

- Drip Tight Shut-Off
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ClO₂

GASPESIA NOW HAS CHLORINE DIOXIDE PULP!

Don't commit yourself on future orders for sulphite pulp until you've tried the *new* Gaspesia Chlorine Dioxide pulp.

This high-quality new ClO₂ pulp is now being produced in a bleach plant only six years in operation. Space was left for this Chlorine Dioxide operation in the original plant plans. Now, Gaspesia is the only North American sulphite pulp made from northeastern woods bleached in a completely modern bleach plant, utilizing chlorine dioxide.

Gaspesia pulps have long been known for their excellent cleanliness, strength and good forming qualities. Now chlorine dioxide makes possible a brightness of 91 G.E.

Orders for trial cars are now being accepted. We suggest you order your initial shipment today to assure a steady supply in the years ahead.

GASPESIA SULPHITE COMPANY LTD.
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SOLD BY: Anglo Paper Products, Ltd.
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SALES REPRESENTATIVES IN THE UNITED STATES:
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APPLETON WIRE WORKS CORP., PLANTS AT APPLETON, WIS. AND MONTGOMERY, ALA.; INTERNATIONAL WIRE WORKS, MENASHA, WIS. AN AFFILIATED COMPANY

Photo by Ewing Galloway, N. Y.



HAM FELTZ says:

**"Reminds me of HAMILTON Felts
... they're made to last longer, too!"**

YOU CAN'T BEAT

**Hamilton
FELTS**

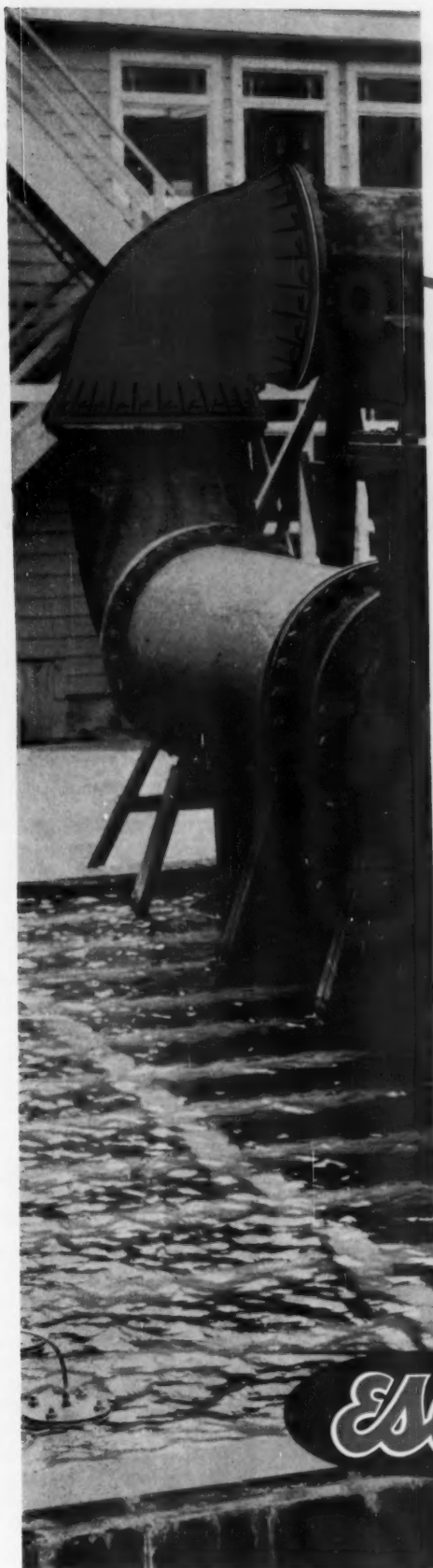
WIN... A NEW Spincast Fishing Outfit

What famous landmark reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. The best letter each month by a paper maker wins a new 1959 model Shakespeare Spincast Rod and Reel—FREE! Every paper maker entrant receives a famous Rex Spoon fishing lure—FREE. Send me your suggestion—today.

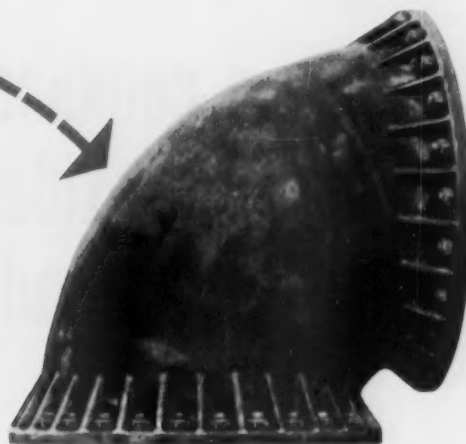
"Egypt's venerable, huge, old Great Sphinx of Ghizah is almost 5000 years old! Hamilton Felts can't quite match *that* record, but paper makers *have* found that Hamilton Felts give longest, high-quality performance between change-overs. They help you beat the high cost of downtime by keeping your machines running at top speed . . . longer . . . turning out more tonnage with less broke or imperfections."

Ask your Hamilton Felt Service Salesman how long-lasting Hamilton Felts can help you reduce the high cost of downtime . . . or write us today!

SHULER & BENNINGHOFEN, HAMILTON, OHIO



ESCO Alloy 43H ELBOW



Handles Hot Sulphur Dioxide Gas in Weyerhaeuser Pulp Plant

Installed in 1945, this 30" ESCO Cast Alloy 43H elbow continues to give completely trouble-free service at Weyerhaeuser Timber Company's Sulphite Pulp Division at Everett, Washington.

Located between the sulphur burners and the cooling pond, the ESCO elbow casting handles corrosive sulphur dioxide gas at temperatures ranging from 1800° to 2000° F. This is one of two headers used alternately. Based on this successful performance, many other ESCO Alloy 43H castings have been installed in this operation.

ESCO's wide range of steel alloys and research facilities are solving many severe heat and corrosive problems for the pulp industry. ESCO also builds complete digester systems for pulp mill service.

Call your ESCO representative for details. Ask him for your free copy of ESCO Catalog No. 175, "Alloy and Stainless Steels for the process and manufacturing industries," or write direct.

ELECTRIC STEEL FOUNDRY COMPANY

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Offices in Most Principal Cities
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IN CANADA ESCO LIMITED



Why a combination of sodium and hydrogen peroxides saves up to \$1 a ton in groundwood bleaching formulas

Over 95% of the groundwood bleacheries in the country that use peroxide for bleaching use a combination of sodium and hydrogen peroxides rather than hydrogen peroxide alone. Reason: Because of the bleaching chemistry involved, they've found it makes better economic sense to use them together. Here's the fascinating story of two chemicals working together—to do an effective job at a lower cost.

Caustic soda is key factor

An effective bleaching solution of hydrogen peroxide requires the addition of substantial quantities of caustic soda. In order to obtain a balanced caustic soda-peroxide formula the "two-peroxide" bleaching method came into use. This method starts with sodium peroxide, which supplies caustic soda and hydrogen peroxide in solution. After the caustic soda limit of this bleaching solution has been reached, additional hydrogen peroxide is added to the formula. The formula is now balanced in respect to sodium hydroxide and peroxide . . . and the process is ready to operate.

Below is a graphic presentation of the chemistry involved. Bear in mind that it is the perhydroxyl ion (OOH^-) that does the bleaching:



Here are two bleaching formulas—one a straight hydrogen peroxide formula, and the other a combination formula—each containing peroxide equivalent to 2% "Solozone" sodium peroxide and a total alkalinity of 1.8% as NaOH.

FORMULA A

1.7% "Albone" 50 hydrogen peroxide
1.2% caustic soda
5.0% sodium silicate
0.05% Epsom salt

FORMULA B

1.2% "Solozone" sodium peroxide
0.7% "Albone" 50 hydrogen peroxide
5.0% sodium silicate
0.05% Epsom salt

(Note: 1-lb. sodium peroxide is the equivalent of 0.85 lbs. of 50% hydrogen peroxide and 1.03 lbs. of caustic soda.)

These are typical mechanical pulp bleaching formulas, equivalent in every way, but Formula "B" will save approximately \$1 a ton over Formula "A" in actual application.

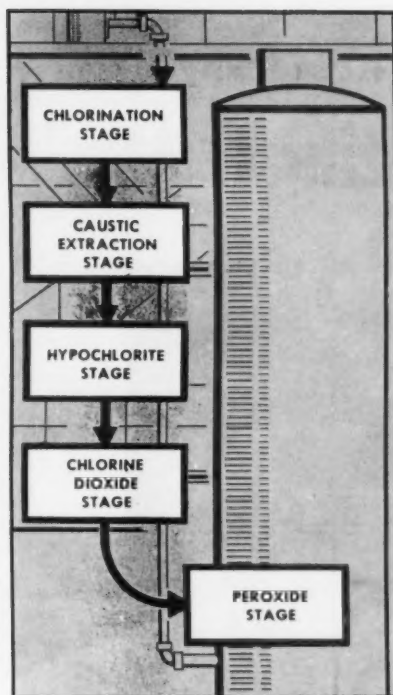
Du Pont supplies both bleaching agents — can help you

Du Pont manufactures "Albone" hydrogen peroxide and "Solozone" sodium peroxide and has served the paper industry with these high-quality bleaching agents for many years. As the only manufacturer of both types of peroxide, Du Pont has a background of practical experience in setting up combination formulas that could prove useful to you. Whether you produce groundwood, sulfate or sulfite pulps Du Pont's Technical Representative will be glad to help. You'll find the Du Pont office nearest you listed at the bottom of the opposite page.

Du Pont's 6-step help you produce

This complete Du Pont service plan will help you meet today's market requirements. It's conducted by experienced technical men employing the full facilities of Du Pont's research and development laboratories. Du Pont will use one or all of the steps below, depending on the situation in your plant.

- 1. Mill conference** — Includes ideas to improve your operation where possible.
- 2. Lab trial** — Tests to evaluate suggestions; a confidential plan for mill trials is submitted.



Schematic of 5-stage Kraft Bleaching Process

5-stage kraft bleaching process provides brightness up to 90 plus stability

You probably know of several bleaching processes that can brighten pulp up to 90, but here's one that does it and provides top brightness stability, too. It's a 5-stage process now in use by several major mills and it combines the best features of three bleaching agents—hypochlorite, chlorine dioxide and peroxide.

Peroxide bleaching in the final stage produces a pulp with high brightness

service plan can brighter pulp...

3. Mill trial—Du Pont works with you to confirm tests on a production basis.

4. Bleachery planning—Du Pont works with you on design and construction of equipment.

5. Bleachery start-up—Du Pont helps train your men in most efficient equipment operation.

6. Continuing service—Du Pont men call regularly to check on your operation.

Result: An efficient bleaching operation in step with changing market needs.

PROFITS WITH PEROXIDE

**"Now we can use hardwoods—
get 78-80 pulp brightness—
we've upgraded our papers"**

R. W. Luethi, president of the Gould Paper Company in Lyons Falls, N. Y., reports great success with a two-stage peroxide-hydrosulfite process for bleaching chip mechanical pulp. He reports: "We can use local hardwoods—birch, beech and maple—for such profitable lines as high-quality book papers.

"Peroxide bleaching eliminates the yellowish cast our pulp had with former hypochlorite system; it gives better whiteness and 78-80 G.E. brightness . . . 35 points over un-



President of the Gould Paper Company
—R. W. Luethi

bleached pulp. Production is up, too, because of the better yield."

Du Pont Technical Representatives worked closely with Gould's staff from initial planning to installation and operation of equipment. The peroxide hydrosulfite process has worked so well Du Pont is now helping Gould with its plan to double present production.

Here are the steps in a typical two-stage bleaching system

- Pulp is washed to remove chemicals used in initial chip treatment.
- The slurry is acidified and thickened to 15% consistency.
- Then bleached with peroxide and neutralized with sulfur dioxide.
- Pulp is diluted to 4% consistency and pumped to hydrosulfite stage.
- After bleaching and washing, it is then pumped into storage chest.

You may be able to profit from this peroxide process for bleaching chip mechanical pulp, just as other mills are doing. If you are faced with "hardwood problems", call Du Pont.

WHEN SHOULD YOU BLEACH IN A REFINER?—IN A TOWER?

If you make cold soda pulp, you can bleach in either place. But you can save thousands of dollars and make a better product if you know when to choose one over the other. To help you make the right decision call Du Pont for a complete and impartial process recommendation. Du Pont is the only supplier of peroxide that can give you the benefit of an extensive working knowledge of both bleaching techniques.

Electrochemicals Department

E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware

DU PONT PEROXIDES

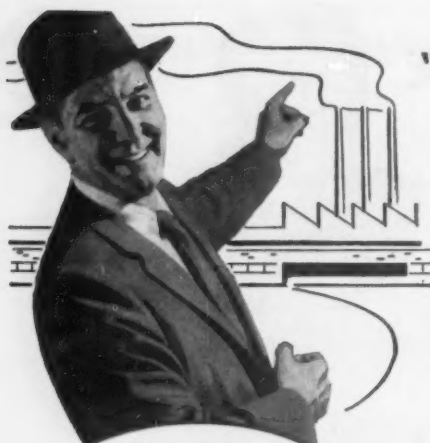
ALBONE®
hydrogen peroxide



SOLOZONE®
sodium peroxide

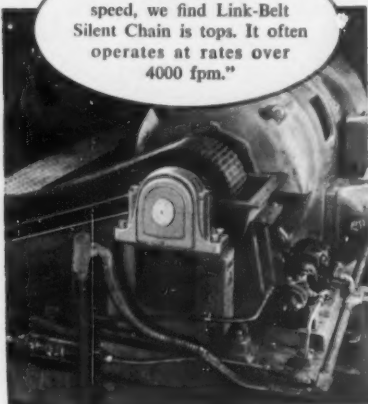
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

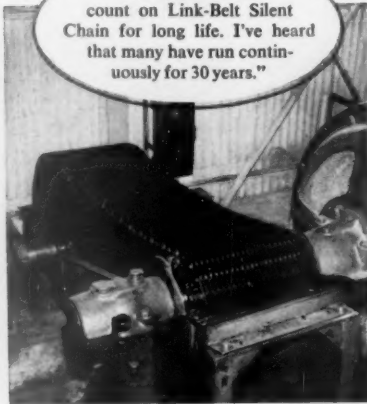


"Join me on a plant tour... see why we're modernizing our drives with Link-Belt Silent Chain"

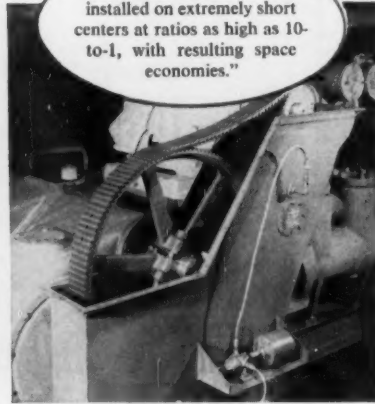
"When it comes to speed, we find Link-Belt Silent Chain is tops. It often operates at rates over 4000 fpm."



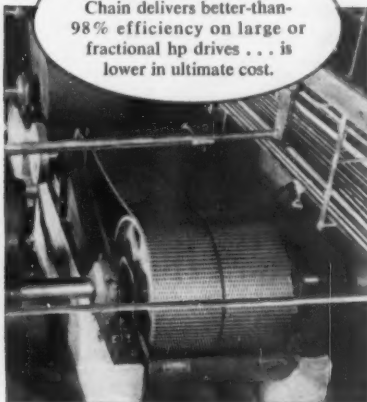
"We know we can count on Link-Belt Silent Chain for long life. I've heard that many have run continuously for 30 years."



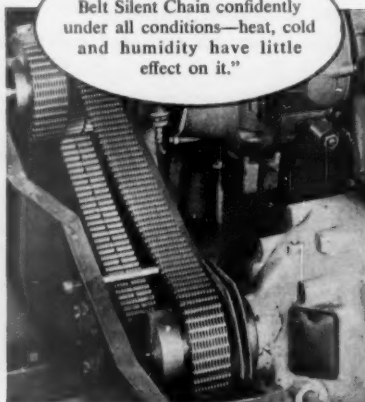
"Silent chain can be installed on extremely short centers at ratios as high as 10-to-1, with resulting space economies."



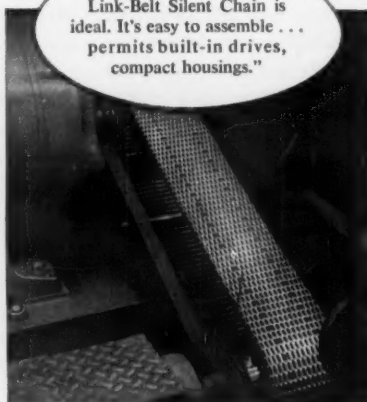
"Link-Belt Silent Chain delivers better-than-98% efficiency on large or fractional hp drives... is lower in ultimate cost."



"We can use Link-Belt Silent Chain confidently under all conditions—heat, cold and humidity have little effect on it."



"In close quarters, Link-Belt Silent Chain is ideal. It's easy to assemble... permits built-in drives, compact housings."



LINK-BELT



SILVERSTREAK SILENT CHAIN DRIVES

FULL DETAILS on Link-Belt Silent Chain are offered in 88-page Book 2425. Get your copy from your Link-Belt office or authorized stock-carrying distributor. Look under **CHAINS** in the yellow pages of your phone book.



LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

General Chemical announces NEW LIQUID ALUM FACILITIES



AT
EL SEGUNDO,
CALIFORNIA

Construction will soon be underway for General Chemical's newest liquid aluminum sulfate producing plant. This time it's El Segundo (Los Angeles), California.

Being built to help meet the growing alum requirements of paper mills, water and sewage plants, and other consumers in Southern California, the plant will augment General's existing West Coast alum facilities at San Francisco, and at Tacoma, Vancouver and Kennewick, Washington.

For sixty years, General Chemical has been a leader in alum research and in continued expansion of facilities to serve industry's needs. In 1911, the company pioneered production of dry alum on the West Coast at its Bay Point Works near San Francisco. Over a decade ago, General also pioneered production and shipping of liquid alum.

YOUR MOST DEPENDABLE SOURCE OF SUPPLY!

With the completion of the El Segundo plant, General Chemical will have 29 works producing dry or liquid alum in the United States and Canada (see list below).

Each of these plants is strategically located to meet regional requirements, offering customers the utmost in convenience and prompt service. Each plant backs up the others, assuring dependable supply at all times. In addition, our chain of warehouses across the country makes stocks of dry aluminum sulfate readily available in every major center of commerce.

Write or phone today for information on how we can serve your alum needs.

Check these 29 General Chemical alum plant locations:

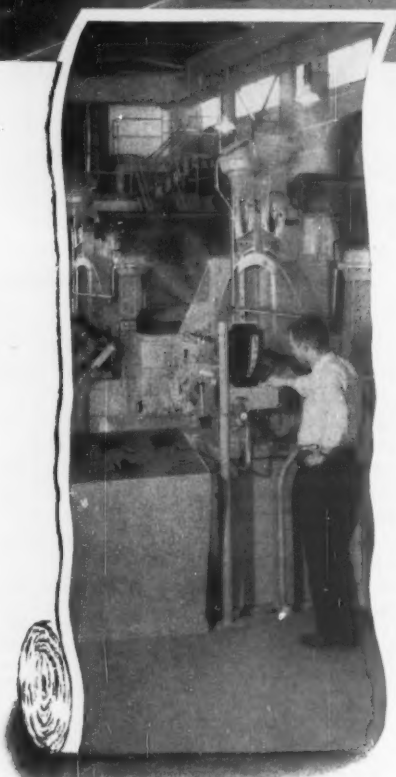
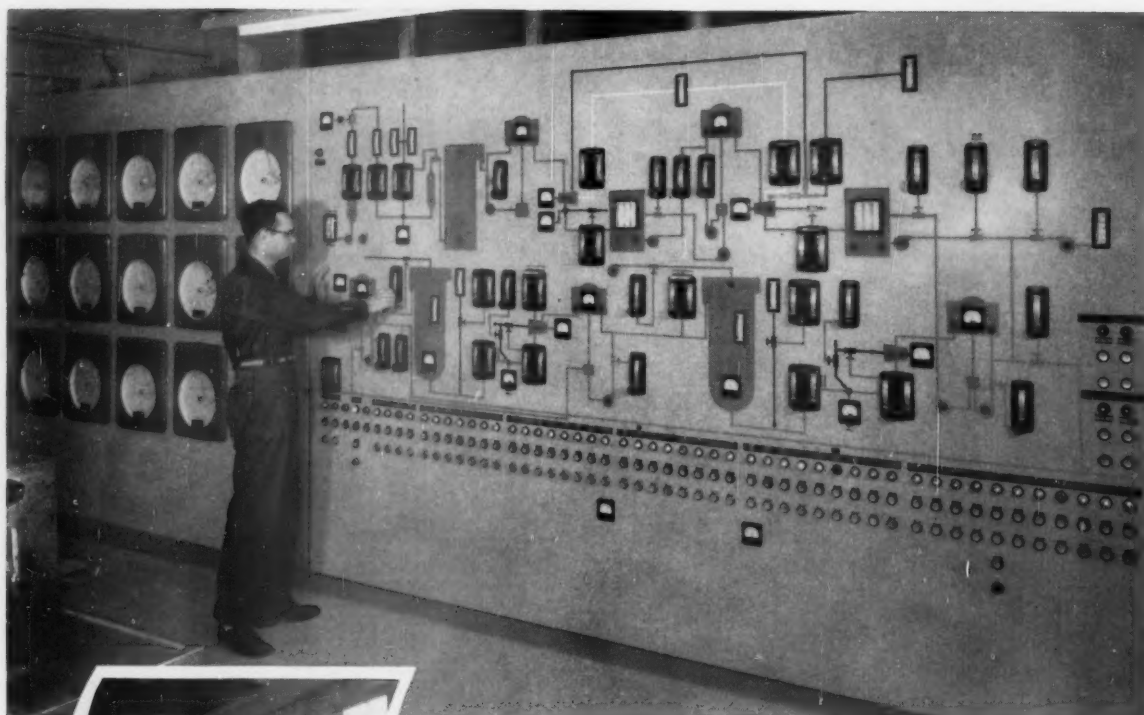
Atlanta, Ga.	Kalamazoo, Mich.	Port St. Joe, Fla.
Barnet, B. C.*	Kennewick, Wash.	San Francisco (Port Chicago), Calif.
Chillicothe, O.	Macon, Ga.	Savannah, Ga.
Cleveland, O.	Marcus Hook, Pa.	Tacoma, Wash.
Denver, Colo.	Menasha, Wis.	Thorold, Ontario*
Detroit, Mich.	Middletown, O.	Valleyfield, Quebec*
E. St. Louis, Ill.	Monroe, La.	Vancouver, Wash.
Hopewell, Va.	New Orleans, La.	Wisconsin Rapids, Wis.
Jacksonville, Fla.	Pine Bluff, Ark.	... and soon El Segundo, Calif.
Johnsonburg, Pa.	Port Arthur, Ont.*	

*In Canada: Allied Chemical Canada, Ltd.

Basic to America's Progress



GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.



Photos courtesy Marathon Southern Corporation

Bailey controls Marathon's five-stage bleach plant!

Marathon Southern's five-stage bleach plant at Naheola, Ala., is one of the most completely instrumented in southern U.S.A.

Rigid quality control—automatic and foolproof—keeps production going at top speed with unvarying excellence in the finished product.

The panel board in the central control room (above) was built and instrumented by Bailey. Note how it is divided into two sections. The 15 Bailey Recorders in the recorder section provide continuous circular chart records. The functional graphic panel on its right provides a complete visual picture of the entire process. Important control variables such as stock consistency, stock flow, bleach liquor flows, stock temperatures, etc., can be watched and instantly corrected, either automatically or manually.

At the same station, the operator can supply consistency-controlled stock (from any of four storage towers) to any of the semi-bleach, pine bleach, or gum bleach pulp chests on a ratioed flow, automatically controlled basis.

Each of the five vat bleach washers is equipped with automatic level control (as shown at left).

This is but one example of how Bailey is helping pulp and paper processors to greater degrees of automation, efficiency, and quality control. Let your Bailey Engineer suggest applications to fit your operation. Or write for specific control systems information for your entire plant operation.

P149-1

PULP AND PAPER DIVISION BAILEY METER COMPANY

1037 IVANHOE ROAD • CLEVELAND 10, OHIO

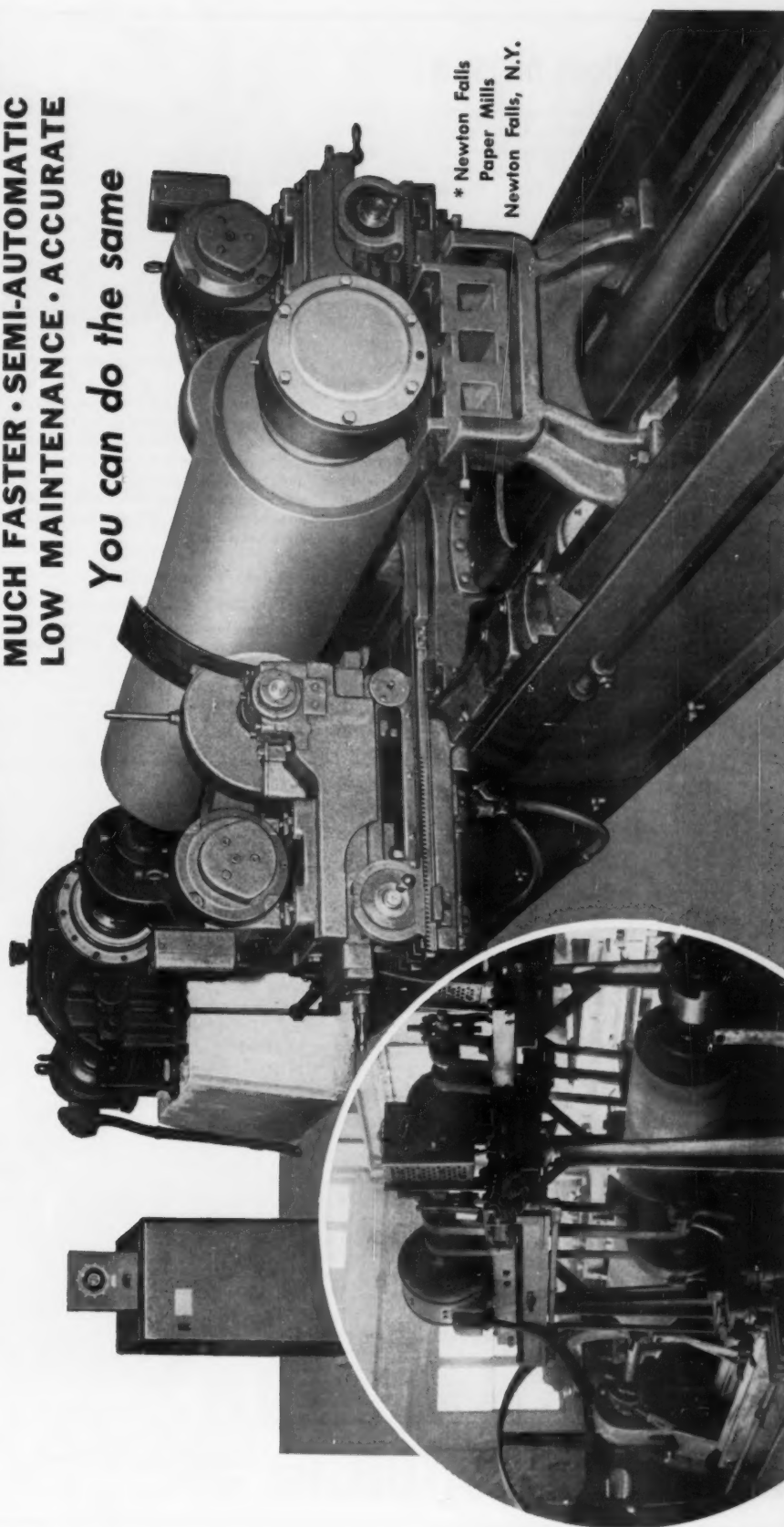
In Canada—Bailey Meter Company Limited, Montreal



NEWTON FALLS* MEETS TODAY'S SPEED-UP Modernizes Their **LOBDELL** Roll Grinder

MUCH FASTER • SEMI-AUTOMATIC
LOW MAINTENANCE • ACCURATE

You can do the same



* Newton Falls
Paper Mills
Newton Falls, N.Y.

UNITED

ENGINEERING AND FOUNDRY CO.
948 FORT DUQUESNE BOULEVARD
PITTSBURGH, PENNA.

Continuous
Pulping

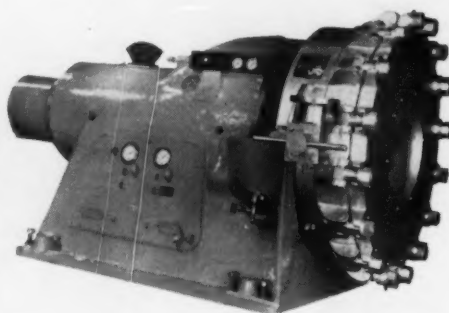
CONTINUOUS DIGESTER

American Defibrator, Inc., offers equipment to meet various demands for continuous pulping of cellulose raw materials. Complete units or components are available for economical production of controlled grades of pulp for the Paper, Wallboard and Roofing Felt Industries.

American Defibrator Continuous Digesters with Screw Feeders or Rotary Feeders and Asplund Defibrators produce pulp at substantial savings in production cost. The capacity of the Defibrator Continuous Digesters ranges from 50 to 250 tons of pulp per day or more. Various raw materials may be used, such as softwood, hardwood, cotton linters or bagasse.

Non-chemical high yield pulps produced by the Asplund Defibrator are used for the manufacture of hardboard, insulating board and roofing felt. Semi-chemical pulps for corrugating medium as well as bleachable grades and pulp for newsprint furnish are also produced by the Defibrator Continuous Digester.

The large size Type D-42 Defibrator is now available and has been developed to meet the current trend in the Pulp and Paper Industry towards larger pro-



TYPE D-42 Defibrator

duction units. This Defibrator is driven by an electric motor directly connected to the main shaft by a gear coupling. The grinding pressure is hydraulically controlled and easily adjusted. Therefore uniform, high quality pulp is produced and D-42 units now in operation indicate capacity of about 100 tons/day of non-chemical and 200 or more tons/day of semi-chemical pulp.

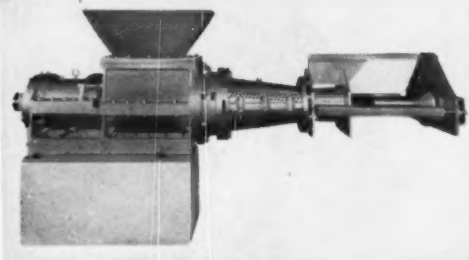
ASPHALT DISPERSION PROCESS

The Asplund Defibrator for treatment of waste paper stock in the "A-D" system has found an extensive application in the Paper Board Industry in order to disperse asphalt, waxes and similar materials in the waste paper. As a result, a clean and sterile sheet is made on the paper machine at considerable sav-

ings, since less expensive waste paper can be utilized. Processing costs for steam, power, labor and maintenance are low. No chemicals are required. Total annual capacity installed now exceeds 1½ million tons of waste paper. Inquiries receive prompt attention.

THE DEFIBRATOR BARK PRESS

The Defibrator Bark Press was developed for continuous dewatering of bark for use as fuel. Processing capacity is about 4 to 5 tons per hour, bone-dry basis. The power consumption at this rate runs between 60 and 75 H.P. The continuous operation reduces labor and maintenance costs to a minimum.



Continuous
Dewatering

THE DAVENPORT DEWATERING PRESS

The Davenport Continuous Press extracts water from fibrous materials, such as various grades of waste paper stock, kraft, sulphite or groundwood pulp. The Model 1B Press has a capacity of about 75 tons/24 hours of pulp, bone-dry basis, dewatering the stock from about 10% consistency to about 35% consistency or higher. The wet pulp entering the press is squeezed and dewatered as it passes through the press and the squeezed out water escapes through the screen plates and drains off at the bottom of the press. There are practically no fiber losses. The pulp is handled very gently by the press which operates at low speed. Therefore, no "fish eyes" are formed in the pulp during the dewatering. The Davenport Press operates very efficiently with low power consumption, high capacity and low maintenance cost. Inquiries receive prompt attention.



AMERICAN DEFIBRATOR, Inc. CHRYSLER BUILDING West Coast: A. H. Lundberg
NEW YORK 17, N. Y. Mercer Island, Washington



"MANANA"

means

YESTERDAY

in OUR language

Designing tomorrow's felts today is not a fast enough pace for Lockport's Research people. Our chemists, yarn and felt designers, quality control men and sales-service technicians concentrate on long-range advancements in felt designs.

The new Lockport Worsted Felt, for example. Time will certify the promise it has already shown. This

may be the felt of the future. We know it has tremendous capabilities in certain applications. But no matter how far-reaching the capacities of the new Worsted Felt, Lockport's development of superior felts will not stop there, because we are dedicated to progress . . . which to the papermakers means *Advanced Techniques in Felt-Making, for More Paper, at Lower Cost!*



LOCKPORT FELT COMPANY, Inc.

Serving the Papermakers Since 1891

NEWFANE, N. Y.

STARKVILLE, MISS.

57,329 CONSECUTIVE



TORTURE TEST NO. 62-29-9

SITE:

McCulloch Test Laboratory,
Los Angeles, Calif.

SAW MODEL USED:
ONE/40 direct-drive.

TEST CYCLE: Start. Accelerate
to 5,000 r. p. m. Stop.

NO. CYCLES COMPLETED:
57,329

AVERAGE PULLS REQUIRED:
TO START: 1.07

**CONDITION OF SAW AFTER
TEST:** Excellent. Starter spring
tension normal. Compression
normal. Wear on moving
parts negligible.

Meet McCulloch's New **NUMBER ONE** Saws

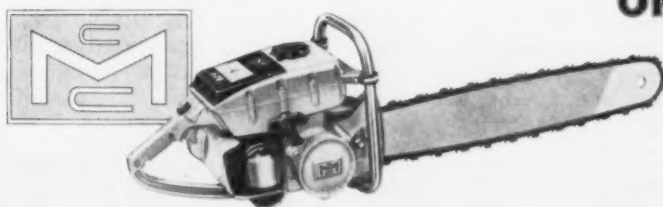
STARTS...and a new McCulloch **Number One** saw is still rarin' to go!

Nobody knows the importance of fast chain saw starting more than a professional sawyer. When he's out on the job, he wants his chain saw to start — and start in a hurry. It means money in his pocket.

McCulloch has gone all-out to make sure its new *Number One* chain saws will start fast and keep starting fast — during years of hard use. Starting tests like the one shown in this ad would break the back of an ordinary chain saw. But McCulloch *Number One* saws refused to weaken even after thousands of consecutive starts.

Starting is just one phase of McCulloch's *Number One* torture testing program. The new chain saws were subjected to nearly every conceivable kind of torture to prove their dependability. Endurance tests. Weather tests. Temperature tests. Field tests by hundreds of professional loggers and woodcutters. The results prove that, dollar for dollar, pound for pound, McCulloch chain saws are *Number One*. Reliable. Lightweight. Powerful. Easy on the man.

See your McCulloch Chain Saw Dealer for a free demonstration.



ONE/70 Direct-Drive

- Built for high-speed, heavy-duty work
 - More power per cubic inch than any other saw its size • Takes bars up to 30" • Weighs only 21 pounds • Dynamically Balanced • Pintail Chain
- Seven models to choose from.
Prices start as low as \$154.95

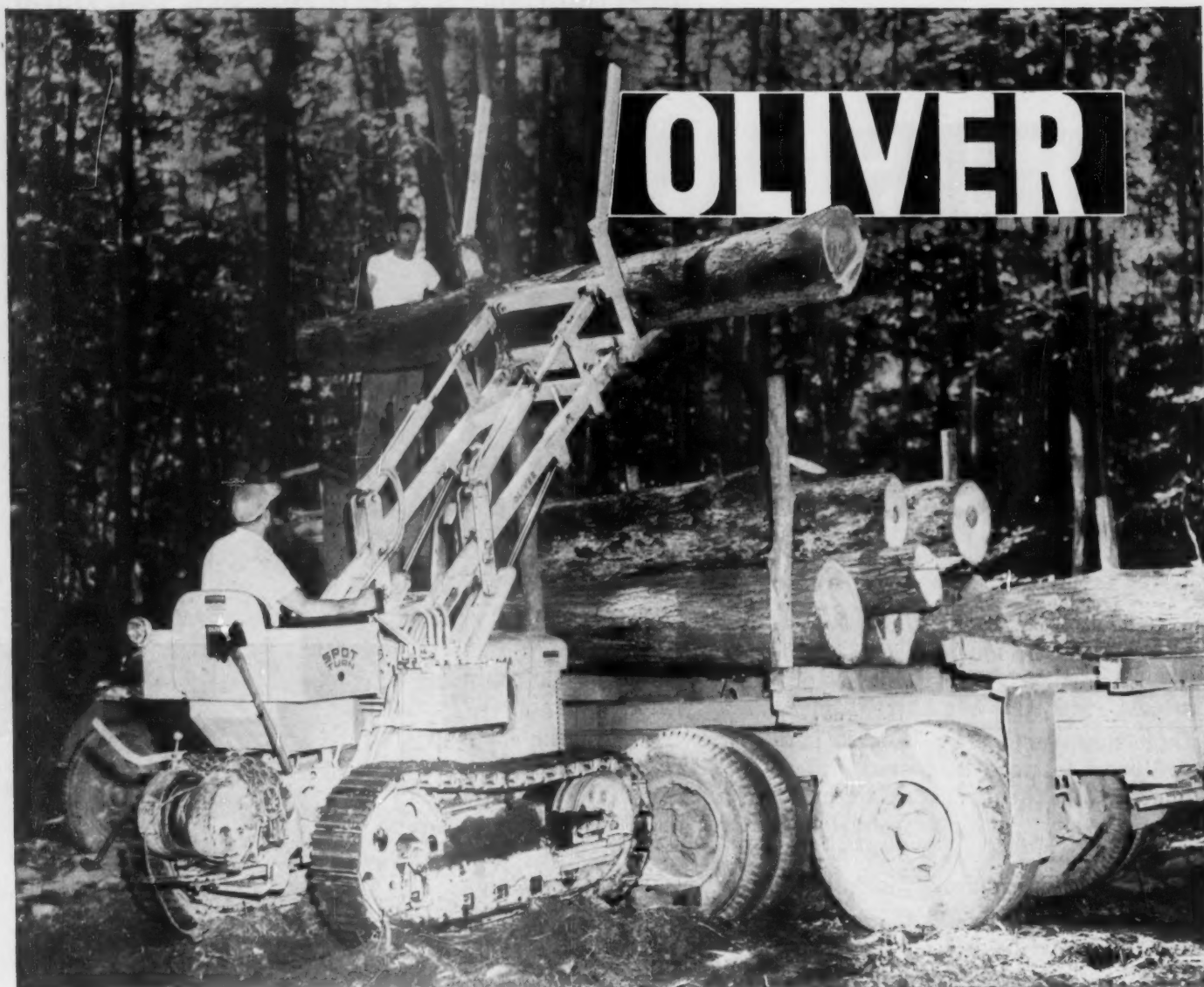
LEADERSHIP THROUGH CREATIVE ENGINEERING

McCULLOCH CHAIN SAWS

Number One In World Sales

For free booklet write McCulloch Corporation, Los Angeles 45, Calif., Dept. P-6

McCulloch Corporation, Los Angeles 45, California • Marine Products Division (Scott Outboards), Minneapolis, Minnesota
McCulloch of Canada Ltd., Toronto, Canada • McCulloch International Inc., Los Angeles 45, California



THE THIRD MAN? HE'S OUT CUTTING MORE LOGS!



It's designed for woods work—right from the ground up. Four speeds, from 1½ m.p.h. to a peppy 5½ m.p.h. Better than 30 h.p. gas or diesel engines. Buckets, blades and boom available for quick attachment to loader arms.

Logger finds two men do the work of three with Oliver's husky OC-46

It used to take three men to load these 1500-lb. logs for Ted Urban, contractor of Lake Como, Penn. But with the quick, easy lifting power of his new OC-46—and no tongs that had to be fastened to the logs—the third man is free to go out and cut more timber.

What's more, the dependable hydraulic fork lifts logs 11 feet, up to the top of the pile; there's no bother of pushing dirt to make a loading ramp.

But these aren't the only advan-

tages of this nimble woods worker. With "Spot-Turn" steering, Mr. Urban says, the operator can get farther into the woods, easily moving in and out of narrow working areas to snake 2½ tons of logs out to the clearing.

Ask for your own work test!

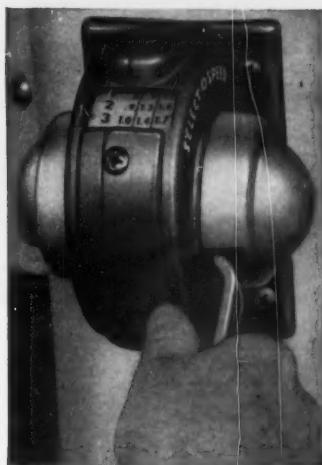
See how the OC-46 can drag and lift more economically for you. Your dependable Oliver distributor will be happy to arrange for a demonstration. Then you can figure your own savings. See him soon!



THE OLIVER CORPORATION

Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio

a complete line of industrial wheel and crawler tractors and matched allied equipment



NEW!

Easy Shifting

up or down through 10 forward speeds, two reverse. No clutch. No conventional gear shift. It's the greatest tractor advance since hydraulics...and only Ford has it!

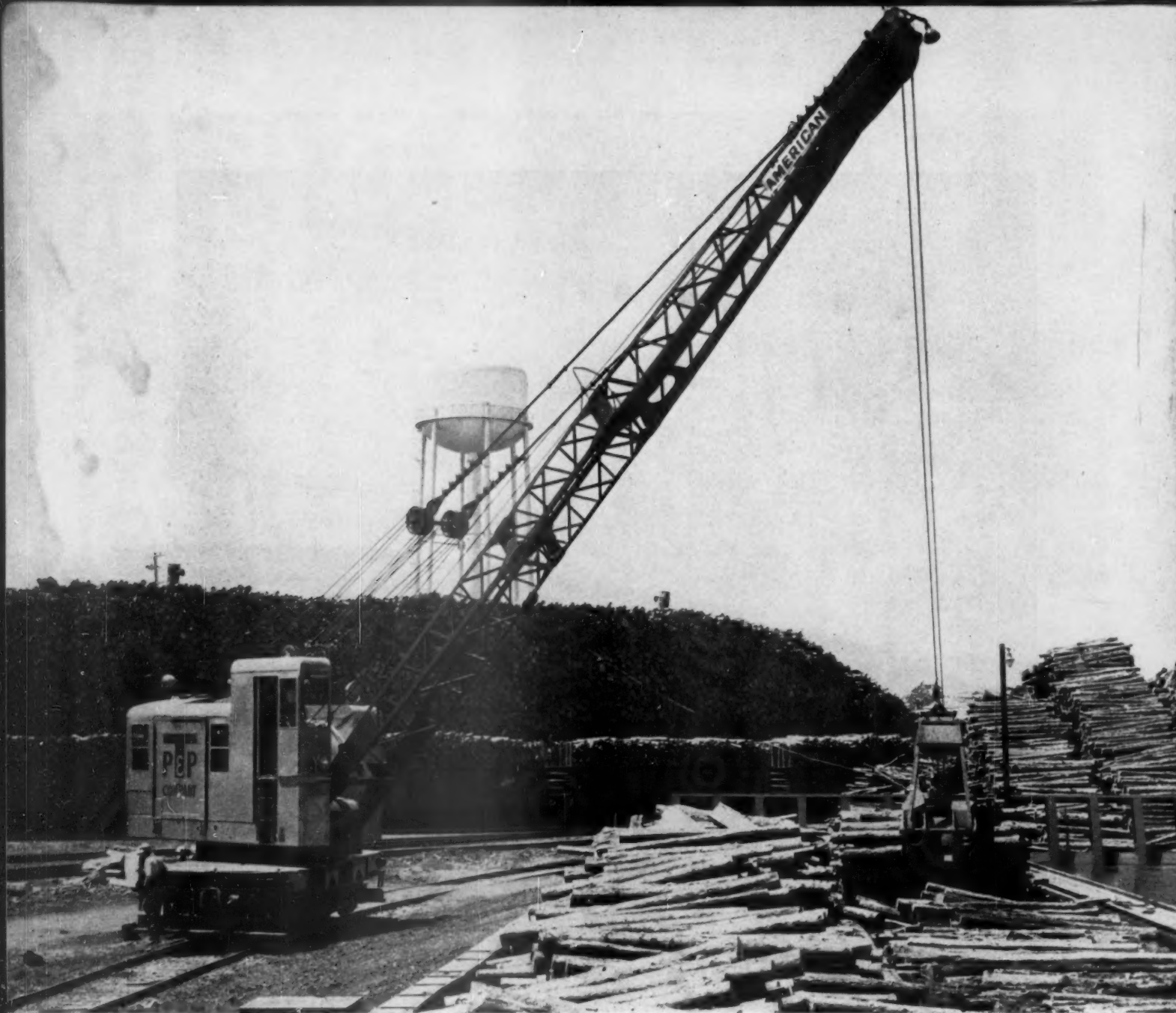
Shift to any speed on the GO!

NEW FORD Select-O-Speed Tractors

Ford's exclusive new Select-O-Speed transmission gives you 10 speeds forward, two reverse—all at the instant command of your fingertips. And because you can instantly shift up or down according to varying job conditions—on the go under load and without loss of power—you'll handle bigger jobs in every tractor power range!

You'll start extra heavy loads in low gear...shift up as your tractor gains momentum...shift down again on the go through tough spots...up as the work eases. New Ford Select-O-Speed can give you more work out-put with less operator fatigue...more fuel economy with less tractor wear. Get full details today from your dealer, or write Industrial Tractor and Equipment Department, Ford Motor Company, Birmingham, Michigan.

YOU SEE MORE **FORDS** BECAUSE THEY SAVE MORE MONEY!



Versatile DiesElectric® Crane unloading pulpwood.

**Only AMERICAN Gives You this Exclusive Line
ON CRAWLERS...ON RUBBER...ON RAIL**

**Whatever your demands, American Off-Track...On Track
Cranes assure you of top pulpwood handling production**

Here is American Dependability at its best . . . boosting production on *any* kind of pulpwood handling job. You can always count on the full line of American Crawlers, Truck and Self-propelled Cranes on the ground—Locomotive Cranes on Rail—to give you maximum effort in every type of work. Serving the pulpwood industry for over three-quarters of a century, American equipment is now better than ever . . . better than *any*. Write us for complete detailed and illustrated catalog information.



Stockpiling Pulpwood
with a 700 Series
American Crawler Crane.

Keeps Trucks Moving:
American 300 Series
Self-propelled Crane.

AMERICAN HOIST
and Derrick Company
St. Paul 7, Minnesota

CROSBY-LAUGHLIN
DIVISION
Drop forged fittings
for wire rope-chain

EXCAVATORS-CRANES
to 2 yds.-60 tons
LOCOMOTIVE CRANES
to 130 tons

DERRICKS-HOISTS
to 800 tons
REVOLVER CRANES
to 400 tons

SUMNER CHIPPERS

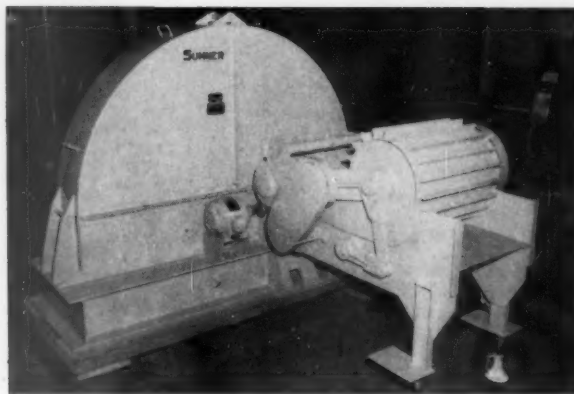
for every purpose

The widely heralded program of complete wood utilization launched a few years ago, presented its challenge to us here at Sumner, and led us into an ever broadening field of chipper research, engineering, and manufacturing of this most important piece of production machinery.

Our present line of chippers and chip screens speaks well for our progress in this field... you will find our Sales, Research, and Engineering Staffs more than anxious to work out any specific problems you may have and to furnish you with bulletins and additional information covering our present standard or special models.

66" — 16 Knife, Helicoidal Face, Wastewood Chipper — The wear (face) plates are provided with helicoidal surfaces which set up an "auger action" that pulls the wood toward the disc in a smooth, uninterrupted flow, thus maintaining an exact chip length. This precision built machine, also available in the 53" size offers you the "utmost" in production and quality. Ask for Bulletin #78.

Designers and
Builders of
Log Handling
Machinery
Wood Room
Machinery
Sawmill
Machinery
Briquetters
Steel, Iron
and Bronze
Castings



72" — 6 Knife Vertical Cut Veneer Chipper — Utilizing the latest designed feedworks, it is the answer to the operator's demand for volume output of chips with minimum operational costs. Ask for our Bulletin #83.

SUMNER

EVERETT,
WASHINGTON

Since
1892

IRON WORKS

In Canada: CANADIAN SUMNER IRON WORKS, LTD., Vancouver

DESIGNERS AND BUILDERS OF MACHINERY
FOR THE FOREST PRODUCTS INDUSTRIES.

United States Distributors: FRED E. BARNETT
CO. . . . 5 offices in California and Oregon . . .
WILCO MACHINE WORKS, INC. . . . Memphis,
Tennessee DILLON SUPPLY CO.
Raleigh, North Carolina.



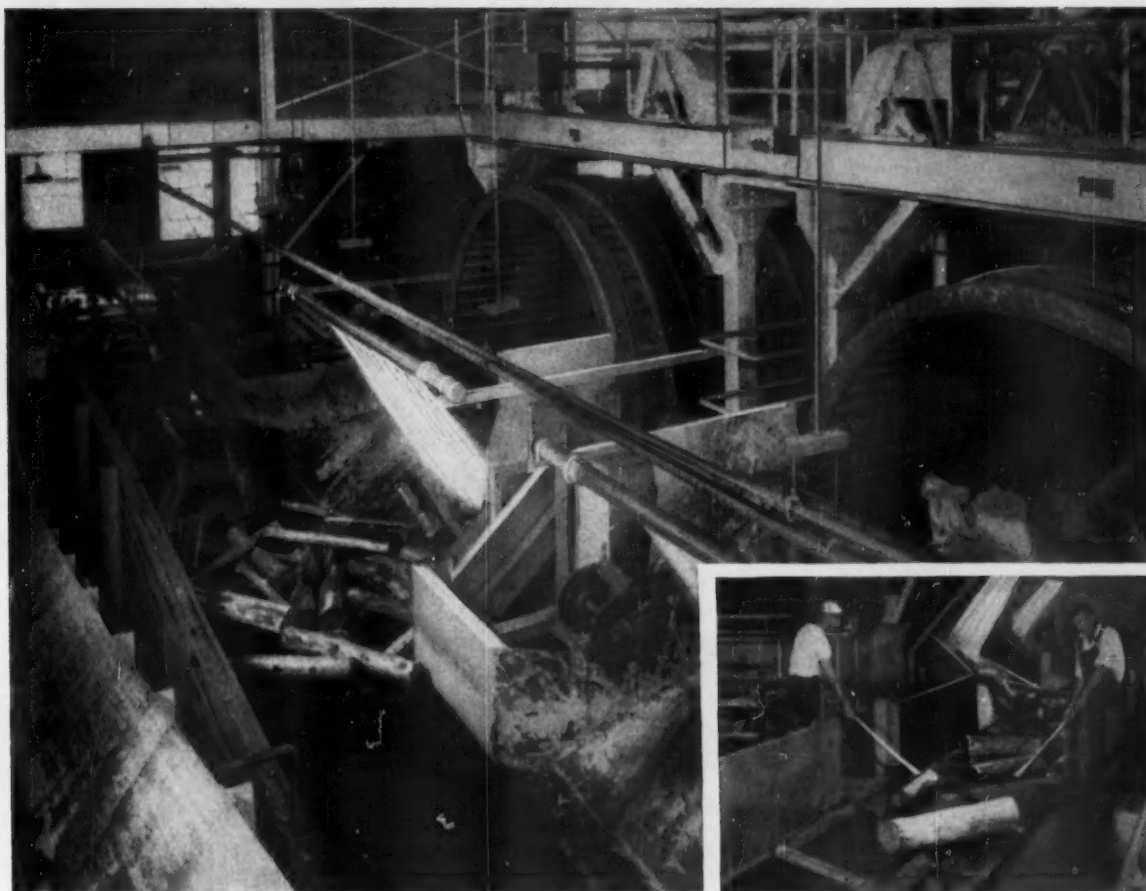
53" — 4 Knife Economy Chipper — Designed for the lower production installation where a high capacity machine is not necessary. Slabs up to 19" wide and 8" thick can be chipped by this light, well-built machine. Ask for Bulletin #85.





Conveyor Belts

Logging a new record!



This U. S. Giant® 60" wide Log Sorting Belt is built to withstand the heavy impact of logs tumbling onto it from the debarking drums (left) and to resist the sharp points of the pickaroons which the men use to sort out rejects (right).

When the Mosinee Paper Mill Company, Mosinee, Wisconsin, required a conveyor system to step up production of wood and pulp, they turned to the company that had helped with the same problem on many installations in the United States and Canada—U. S. Rubber.

"U.S." engineers studied the requirements, the mill layout, and—above all, the problem of costs. Eight "U.S." conveyor belts were installed, made endless on the job. Production went up to a new record for the log-sorting operation of Mosinee Mills.

The easiest and most economical way to increase haulage and to lower costs is to enlist the services of United States Rubber conveyor belt engineers. Their wide and varied experience in materials handling for the wood products industry allows them to give you the very best help obtainable.

• • •

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and the finest quality industrial rubber products.



Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N. Y.

In Canada: Dominion Rubber Company, Ltd.



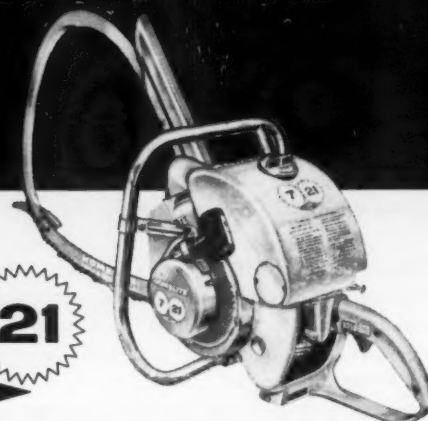
**"Homelite is the only saw that doesn't
shake apart in pulp cutting"**

ANOTHER USER TESTIMONIAL FOR **HOMELITE**

Mr. J. C. Johnson of Trevilians, Virginia does some tough cutting. When he buys a chain saw, he demands the best, like the gear-drive Homelite 7-21C.

Ideal for the production cutter, the 7-21C has all the power you need for cutting either pulp or timber. It cuts through 20" trees in 18 seconds, with enough lugging power to fell trees up to seven feet in diameter. Its balanced 21 pounds (less bar and chain) means easier, safer handling in any cutting location, any cutting position.

Available with the new 16" plunge-cut bow that eliminates stooping, makes your job easier. Also with straight blades from 14" to 60", brush cutter, and power peeler.



As little as \$6.10 weekly after small down payment

- ★ fells trees up to 7 feet in diameter
- ★ only 21 pounds, less bar and chain
- ★ straight blades 14" to 60"
- ★ 16" plunge-cut bow, brush cutter, power peeler, clearing bar

PROOF — In part, Mr. Johnson told us: "My Homelite is the only saw I ever found that didn't shake apart with the rough cutting it's used in. I have been cutting pulpwood for over 15 years, and the Homelite saw will hold up better than any other kind of saw I have ever tried."

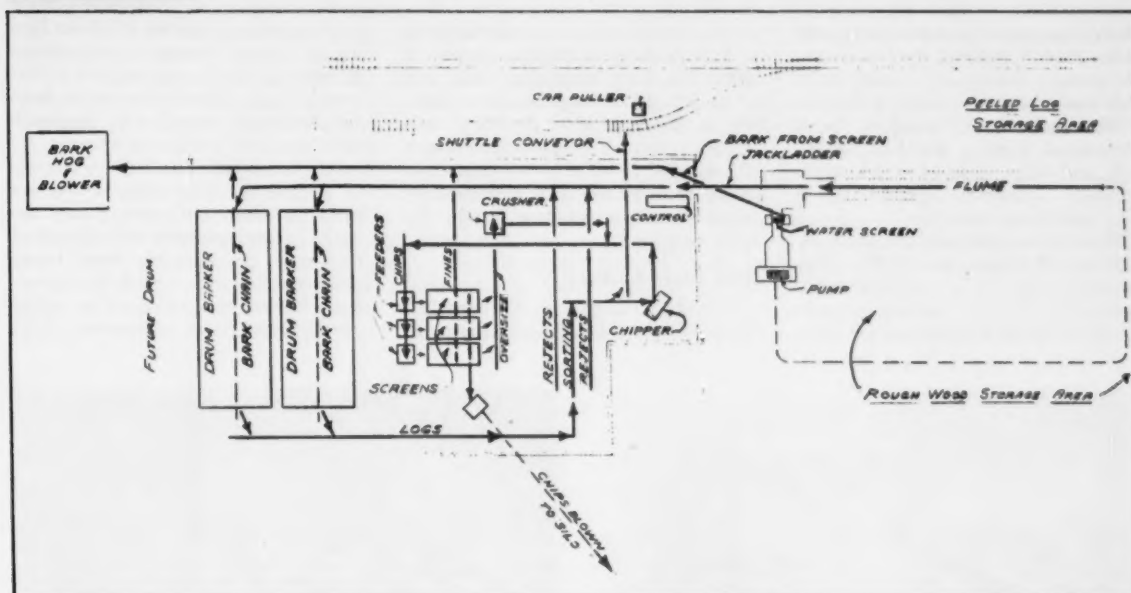
Ask your Homelite dealer for a free demonstration of the gear drive 7-21C. Find out, too, about the other professional saws in the famous Homelite line.

THINK FIRST OF QUALITY...THINK FIRST



**OF
HOMELITE**

A DIVISION OF TEXTRON INC.
7711 RIVERDALE AVE.,
PORT CHESTER, NEW YORK



FLOW DIAGRAM of new Neutracer woodroom for hardwoods at Hammermill Paper Co., Erie, Pa.

New Neutracer Hardwood Woodroom

Hammermill Paper Co. had three objectives: quality of product; low manpower requirements; minimum maintenance

Erie, Pa.
● The new Neutracer woodroom at Hammermill Paper Co., with its designed capacity for 480 cords-a-day of mixed northern hardwoods, has resulted from a recent company research program. Hammermill engineers first toured other North American installations and then selected and combined the equipment and ideas they considered to be most practicable.

Outstanding features are the flume, the centralized control and the chip and bark blowing. The principal objectives affecting the design were: quality of product, low manpower requirements and minimum maintenance.

The woodroom is designed to handle intermittent peak loads of up to 45 cords per hour in order to main-

tain an average of 30 cords per hour. The wood is received in 4 or 5 ft. lengths.

Equipment

All equipment except the flume and jackladder are housed in one building, 160 ft. long by 104 ft. wide by 40 ft. high. The building walls are of corrugated aluminum and glass wool sandwich panels on a structural steel frame above an 8 ft. high concrete block wall. The interior aluminum is perforated for sound absorption. The roof is precast concrete slab, with 1 in. Celotex insulation and built-up roofing. The building is windowless except for the one window at the control station. Lighting is fluorescent throughout with an average of 40 foot candles. General lighting is by Day-

Brite and lights in moist locations are Paramount Craft Lites.

The 450 ft. long Hammermill designed flume is of an open U shape 4 ft. 6 in. deep and 3 ft. 9 in. wide at the top and made of $\frac{1}{2}$ in. thick steel plate set on concrete piers. The flume aprons are oversize hardwood logs set in washed gravel. The flume slopes 3% in. per hundred feet and the water velocity is 7 fps. The water is recirculated through an underground 24 in. reinforced concrete pipe by a 14,000 gpm, 125 hp, Goulds pump. A Link-Belt vertical trash screen is used to remove solids from the water.

The chief operator can see the entire yard operation and most of the woodroom from his station at the main control panel high in the building. A traffic light signal system is used to

Pulpwood Section

control the speed of unloading to the flume. Push-buttons at the panel control pumps, conveyors, screens, chippers and other equipment. A feature of the main control panel is the 4 interlocked systems for logs, chips, bark and chip blowing which automatically signal the operator as to their operating status.

Wood is dropped into the flume by Pettibone-Mulliken Cary-Lifts. The Cary-Lifts are equipped with interchangeable grapples and orange peels for either tiered or jackstraw wood.

The wood moves from the flume to a 120 ft. long jackladder sloping at 20°. The Esco manganese steel coil chain has 4½ in. high by 30 in. wide flights. The jackladder discharges to a 42 in. wide rubber belt from which the wood is diverted to the chipper or either of two barkers by hydraulically operated plows controlled from the main panel.

Two Drum Barkers

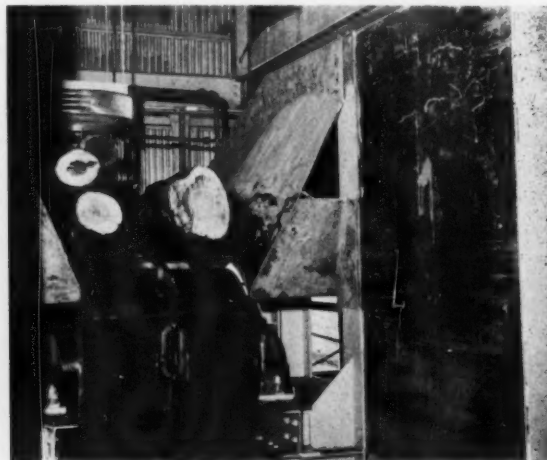
Two 12 ft. by 67½ ft., three section, D. J. Murray drum barkers are used.

Each individual section is driven by a 75 hp motor through an American Blower Co. fluid coupling and a Falk gear reducer. The discharge rate from the drums is controlled by hydraulically operated vertical gates.

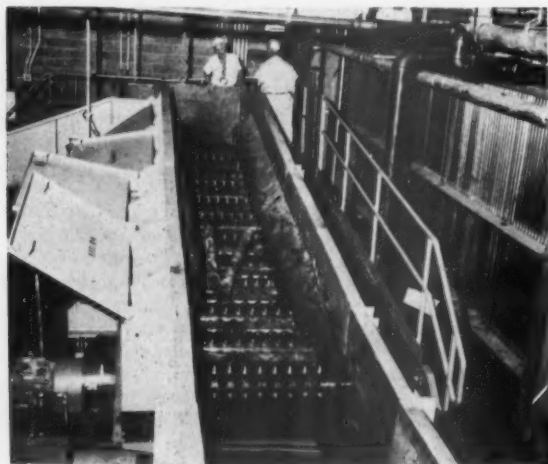
The wood falls to a belt and travels to spiked speed-up rolls which are used to orient and stretch out the sticks before making a 90° change of direction. From here they travel cross-wise on a 60 in. belt for inspection. Rejects are pulled off to either of the two reject conveyors which



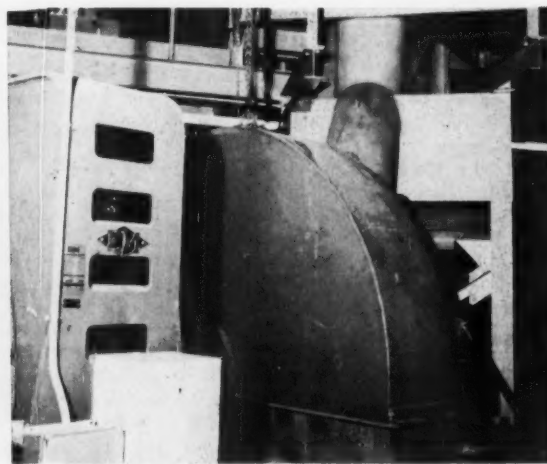
UNLOADERS REACH over railcar to drop load into flume. Pettibone-Mulliken Cary-Lifts have interchangeable grapples and orange peels for tiered or jackstraw wood.



JACKLADDER DISCHARGES LOGS to 42 in. wide rubber conveyors. Jackladder is 120 ft. long, slopes 20°. Esco manganese steel coil chain has 4½ in. by 30 in. flights.



SPIKED SPEED-UP ROLLS ORIENT and stretch out logs before making 90° change of direction. Logs then travel cross-wise on a 60 in. belt for inspection.



CHIPPER IS DRIVEN by engine mounted 400 rpm, 1000 hp Electric Machinery synchronous motor. Chipper is standard Carthage 96 in. disc, 12 knife with 19 in. spout.

take the wood back to the barker feed belt. Accepts drop onto another belt feeding the chipper. Both the inspection and chipper feed belts have Louis Allis Adjusto-Speed drives.

The chipper is a standard Carthage 96 in. disc, 12 knife, with a 19 in. spout. It is driven by an engine mounted 400 rpm., 1000 hp, Electric Machinery synchronous motor.

Chips are moved and elevated to the screens by Jeffrey Manufacturing Co. drag flight conveyors. Chip flow to the 3 Orville Simpson 60 in. x 150 in. Rotex screens is controlled by Jeffrey Traylor vibrating feeders. Over-size chips are broken up by a Lombard chip crusher. Accepted chips are belt conveyed to the Rader Pneumatic blowing system feeder. Air for the

system is supplied by a 250 hp, Sutor-Bilt blower and the chips are blown through a 14 in. pipe and 3 way valve to any of three cyclones located from 650 to 850 feet away.

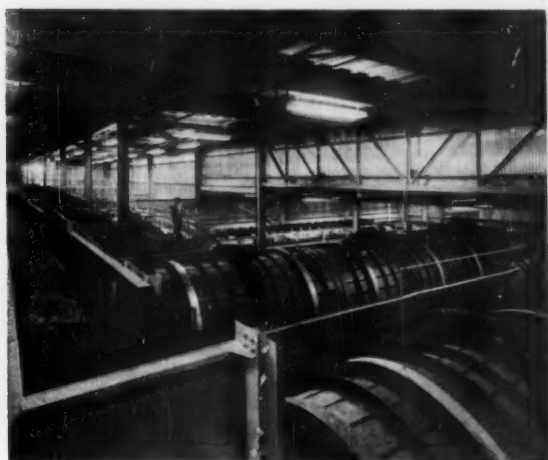
Innovation

An innovation for Hammermill is the use of a retractable conveyor to be used for loading rail cars with peeled wood. More wood will be barked during the summer than will be chipped. The excess will be loaded on cars and put in storage to be reclaimed for chipping during the hard barking winter months.

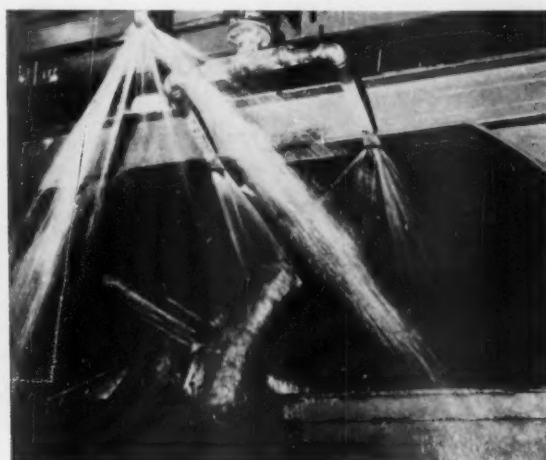
The Goodyear conveyor belts in wet locations were made endless by vulcanizing on the job. Dry belts were mechanically spliced. Log belts are 6

ply 32 oz. with nylon breaker strips and have a $\frac{1}{4}$ in. rubber top cover and $\frac{1}{8}$ in. bottom cover. Dodge Sper-align antifriction bearings were used throughout the woodroom to save power and routine lubrication, and the other conveyor machinery was furnished by Jeffrey Manufacturing Company. Gear reducers were furnished by Falk and Cleveland Worm. An Alemite oil mist system is used to lubricate the 8 roller chain drives to eliminate the use of oil tight casings.

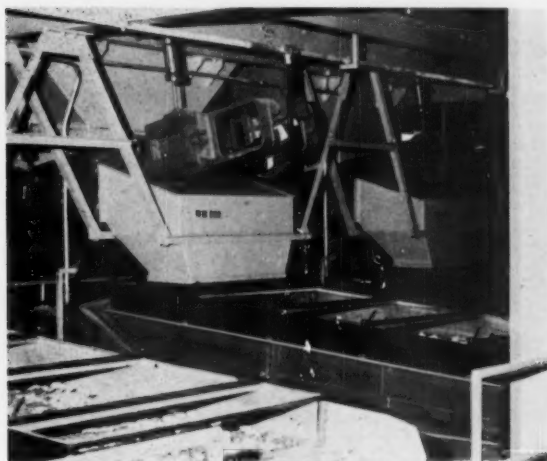
The bark is collected under the drums by chain conveyors from which it is belt conveyed to a Jeffrey 36 in. x 48 in. bark hog driven by a 200 hp, 1200 rpm motor. Hogged bark will be blown to the new bark burning bailer approximately 2000 ft. away.



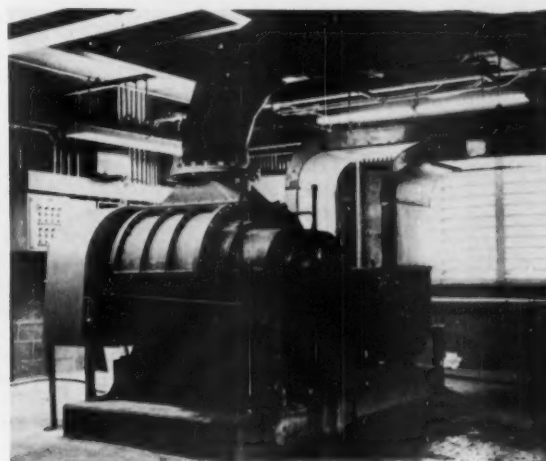
HYDRAULICALLY OPERATED PLOWS FEED LOGS to chipper on either of two D. J. Murray drum barkers, 12 ft. by 67½ ft., three sectioned.



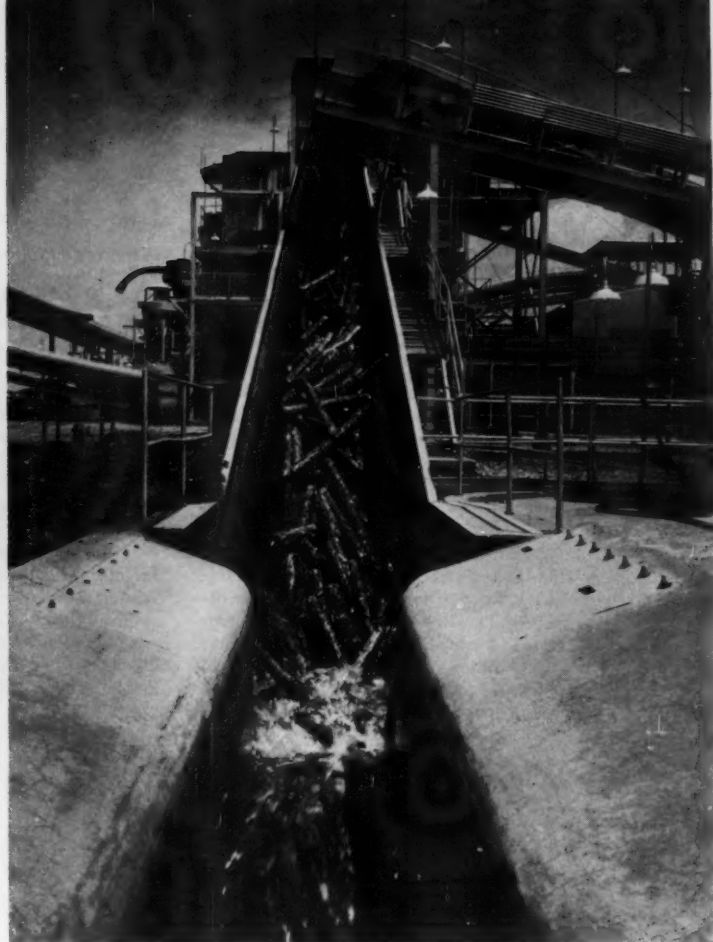
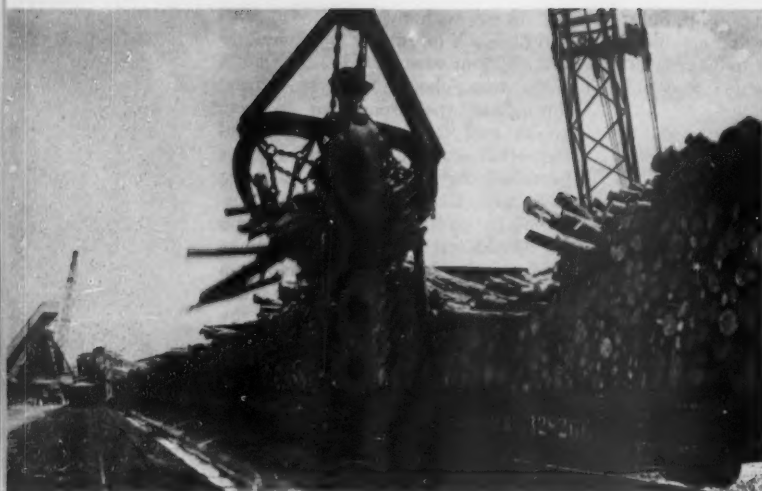
VERTICAL GATES ON DRUM BARKERS ARE HYDRAULICALLY operated and these control the discharge rate from the drums.



VIBRATING FEEDERS CONTROL FLOW of chips to three Orville Simpson 60 in. by 150 in. Rotex screens. Jeffrey Traylor vibrating feeders are used.



CHIPS ARE BLOWN through 14-in. pipe and 3-way valve to any of three cyclones by Rader pneumatic system. Air is supplied by 250 hp Sutorbilt blower.



Bowaters will use 275,000

cords a year in pulp mill;

40,000 more in board mill;

It all adds up to

A New Market for Carolina Wood

● Eight hundred cords of wood a day is quite an appetite for wood and here in the heart of the Piedmont section a new mill has created such a hunger.

Bowaters Carolina with its new pulp mill will use 275,000 cords a year. And with the advent of its new hardboard mill, due on-line early next year, this demand will be increased by 40,000 more cords a year. Much of this, happily, will be hardwood in an area where pine is king.

Responsibility for perfecting the woodlands operation for this new mill rests on the shoulders of Herb Curruth, head of the Catawba Timber Co., which will—under the recently changed South Carolina law, be able to purchase as much as 500,000 acres of timber—if he can find it. Under the old law, foreign companies were limited in the amount of acreage they could own in South Carolina to 500 acres.

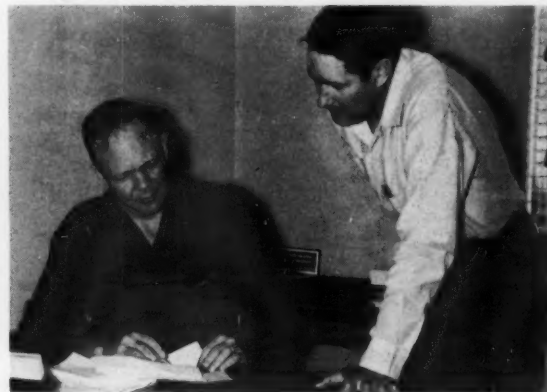
Foresters have established four district offices for this new timber operation. They are at Lancaster, S.C.; Clinton, S.C.; Newton, N.C.; James-

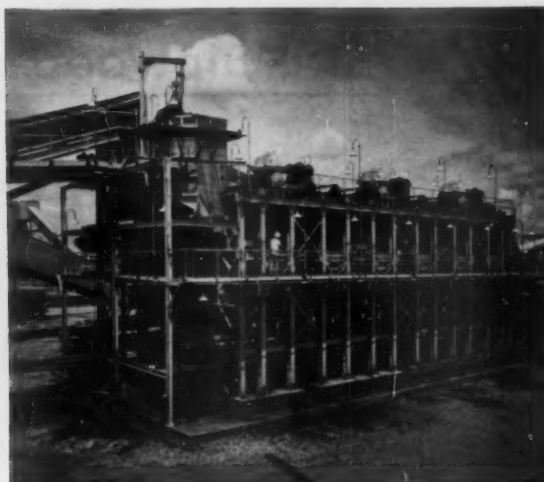
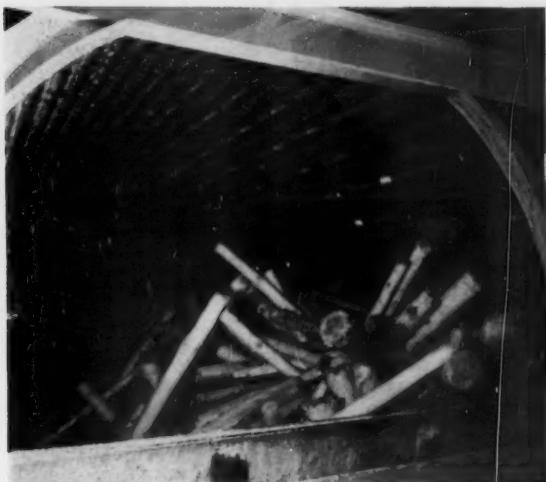
town, N.C. District foresters will be responsible for procuring quotas of pine and hardwood to fill the needs at Catawba. In addition, they will promote tree farms and purchase land. Opening a market for lowgrade hardwoods with the hardboard mill will aid in improving tree stands, Curruth points out.

The new mill receives about 10% of its wood requirements in chip form, another 20% by truck. In all, some 70% of the wood comes into the mill by rail.

Rail wood is unloaded into storage piles by a 50-ton crawler crane with a Blaw Knox grapple. It can also be dropped directly into the concrete

**GETTING
READY FOR
BIG wood de-
mand, Carolina
Woods Mgr.
Herb Curruth
and asst. mgr.
Morris Morgan
inspect the first
of many pulp-
wood purchases.**





TUMBLING LOGS THROW UP ANGRY PELLETS OF BARK (left) as they spin in one of two Fibre Making Processes drums (right) at the new Catawba, S.C., mill. The drums are 67½ ft. long, have three 75 hp motors for each drum. Bark is conveyed to storage.

flume which serves the wood yard. Truck wood is handled in similar fashion. The 3-ft. wide flume is 1,000 ft. long and is served by two 10,000 gpm Buffalo pumps which circulate water at a rate of five feet a second. A grit collector and conveying system is provided by Chain Belt.

Two Fibremaking Processes drums, 12 ft. by 67½ ft., handle wood which is conveyed from the flume by a chain conveyor. Each drum is served by three 75 hp induction motors through fluid couplings and parallel shaft reducers. Bark from the drums as well

as from the flume is conveyed through a swing hammer shredder to a 14,000 cft. circular bin which is equipped with a Miller Hoffit feeding machine for delivering bark from the bin to the bark burner. Logs are checked on a 66 in. wide sorting belt.

Accepted logs are delivered to two 112 in. 12 knife Murray chippers and chips are screened over Orville Simpson screens. Fines from screens are conveyed to the drum refuse system, oversize chips are fed to a 36 in. six knife rechipper and accepted chips are conveyed to either of two tile

chip silos. Link-Belt rotary feed plates 17 ft. dia. with a capacity 135 cords an hour deliver the chips to a belt conveyor and they are automatically weighed before being fed into the digesters by Continental Gin trippers.

Separate System

A separate system has been designed to handle chips arriving by truck. They are dumped into a 58 ft. long pit and chain conveyed into a Radar Pneumatic system which blows them into a cyclone for delivery over the chip screens.



CAREFUL SCRUTINY IS GIVEN LOGS on wide rubber belt sorting deck which has automatic Westinghouse controls. Logs are next chipped in two 12 knife 112 in. Murray chippers. At right, long rubber conveyor delivers them to chip storage—undercover.

New Data for Salvage Logging

... aids in accurate prediction of removal costs. A USFS experiment station determines "will it pay its own way?"

● Cost prediction has been made more objective in determining whether wood will be removed from the forest as salvage. Although not always the critical factor (sanitation cutting can be imperative regardless of economics), such forecast is a criterion on which action is normally predicated. Will potential salvage material at least pay its own way?

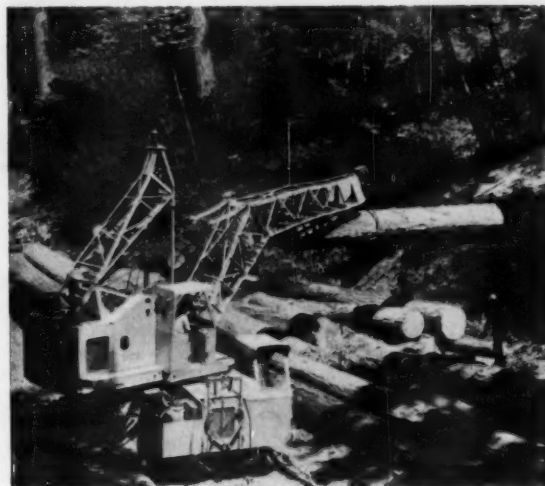
Accurate prediction of removal costs consequently becomes a significant factor in deciding which forest areas will be salvage-logged. Recent studies at the Pacific Northwest Forest & Range Experiment Station, Portland, Ore., have demonstrated that such prediction is definitely within the range of possibility.

The information was recently issued as Research Paper No. 32, "Yarding and Loading Costs for Salvaging in Old-Growth Douglas Fir with a Mobile High-Lead Yarder." The report was prepared by John Carrow, assoc. professor of forest management in the School of Natural Resources, Univ. of Michigan. He was assisted in the field phases by R. F. Keniston of the School of Forestry, Oregon State College. Skagit Steel & Iron Works, Sedro Woolley, Wash., provided grant-in-aid financial assistance.

The 26-page report specifically applies to salvaging dead and down timber with mobile high-lead yarders in old-growth stands reserved for future cutting under the staggered-setting management system. The time-production study, followed by data analyses, identified the factors affecting each step of the yarding sequence. These results facilitate predicting time per turn for different yarding distances and log sizes under conditions similar to those encountered in the study. An equation was developed to relate loading time to the number of logs per load.

Data was obtained on yarding costs by applying the yarder operating cost rate to yarding times. A consideration of the geometry involved in yarding to landings along contour roads brought in other related logging costs

MOBILE YARD-ER-LOADER of type used in making salvage logging cost study. Built specifically for logging, the unit (Skagit SJ-4) has self-adjusting hydraulic outriggers, 360° boom travel, 1- to 30-mph road speed, 500-ft. yarding range with a ¾-in. main line.



—changing cable road, moving and rig-up, truck-road construction, so that cost data from both the time study and operator records can be used to analyze problems affecting planning.

The results indicate limits of volume per acre and log size within which efficient high-lead salvage operations can be predicted. A formula for evaluating the effect of these and other variables in determining total yarding, moving and road costs is included in the report.

Regarding the application and usefulness of information obtained from the study, the report states: "The planned salvage of dead and down timber in old-growth Douglas fir forests before the final cut is of particular interest where stands are being harvested by the staggered-setting system of clear cutting. Under this system the whole forest is made accessible within a relatively few years by a network of high-standard roads. When areas are clear cut, all merchantable dead trees are harvested with the green timber. This material should also be salvaged periodically from the reserve settings—which may not be harvested for many years—if it can be done economically and without serious damage to the residual stand and the

soil. Some material has been salvaged from reserve stands along existing roads and on favorable slopes, but the operation has often been piecemeal rather than part of a planned forestry-logging program."

Salvage Logging Significant

Old-growth timber in the Douglas fir region—of which there are still some 7,000,000 acres—is well suited to clear-cutting by staggered settings. The system, consisting of complete harvesting of isolated patches in areas of up to approximately 100 acres, leaves the logged area surrounded by standing timber serving as a seed source for natural reseeding. The next harvest patch may be miles away.

In addition to this provision for reseeding (which results in even-age stands to which shade-intolerant Douglas fir is ecologically suited), staggered, clear-cut harvesting has made it economically feasible to more rapidly extend roads into remote forests. As a result of this establishment of initial roads, large areas have been opened up—a prerequisite essential to management, utilization and realistic forest conservation—more rapidly than would have otherwise been economically possible.

Cutting plans for USFS working circles call for continued cutting of old-growth over periods ranging from less than 10 to more than 90 years, the average around 50. Hence, by plan, it will be nearly 100 years before some of these old-growth tracts will be clear-cut.*

All "leave" settings contain dead and decaying trees, either fallen or

standing. The per-acre volume is usually low, the quality generally good. Intensive management of leave areas, through salvaging both dead timber and standing trees that will die before otherwise harvested, can (1) directly increase forest yield and (2) improve the residual stand.

Pacific Northwest Forest & Range Experiment Station's report on the

salvage-logging costs study is significant because it contains data that can be applied to help determine what can and what can't be salvaged economically.

*Somewhat similar conditions exist in Bureau of Land Management timber and, to some extent possibly, in large private holdings.

Ideas for Developing Mechanical Tree Planters — With Some Tips from Poland

BY Z. TODORSKI

Windsor Mills, Quebec, Canada

The article by Ray V. Malecki, Union Bag-Camp Corp. (page 125, PULPWOOD ANNUAL SECTION, PULP & PAPER, May 1959 issue) on the economies of tree planting has stirred my enthusiasm for the reforestation program. I would like to offer some general suggestions to help in covering the many acres of waste land with green forest. Your call for new ideas has made me speculate about a simple and inexpensive tree planting machine that can be easily mounted on most of the farm tractors. Such a gadget could be loaned to any person wishing to plant a few acres of land by an agency.

Usually when a man gets obsessed with a task to find a solution to some specific problem it helps to lay down specifications for it. Often a rough sketch on a scrap of paper helps to fix the fine points in a question. And if after a few days or even weeks no solution can be found, stop thinking about it so that the subconscious mind may work on it. Well for this, there is no 100% guaranteed recipe. It often helps to set yourself in a relaxed position on a davenport or an armchair with your legs in an elevated position, a coffee table may serve the purpose, that is, if your wife is not aware of it.

In the article by Mr. Malecki there is a simple but artful sketch showing all the basic steps used by a mechanical planter. There is the tractor on which the planter should be mounted, the hydraulically operated wedge to make the hole in the ground. Then some sort of a mechanism to insert the seedling into the hole and finally the second thrust of the wedge is to close up the hole with the seedling in it. All the three basic operations are very simple but in order to make the mechanical planter a profitable machine, all these steps have to be synchronised to permit at least 2,000 complete operations an hour. At such speed it

would be possible to plant about 2 acres every 8 hours or one seedling every 2 seconds.

Here I would like to relate some of my experiences in planting pine seedlings in Poland at the time of my youth.

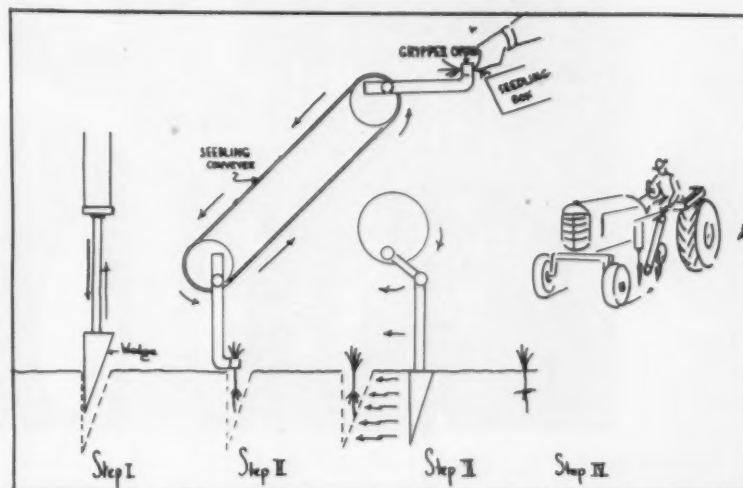
The planting was done by hand with the aid of a special tool which was made from steel bar about $\frac{1}{4}$ in. thick by 2 in. wide and 12 in. long. One end of the bar was sharpened and the other was formed to receive a wooden handle about 2 in. dia. and 3 ft. long. The wooden handle had a wooden cross-piece at the top for holding the "spade" and one steel cross-piece at the bottom for driving the spade into the ground with the boot.

The trees, one to two years old, were soaked first in a clay slurry to make the roots more manageable when inserting them into the hole. Also the clay slurry which sticks to the seedling provides certain amount of moisture to help the tree with the water supply during the critical pe-

riod of "acclimatization" to the new soil.

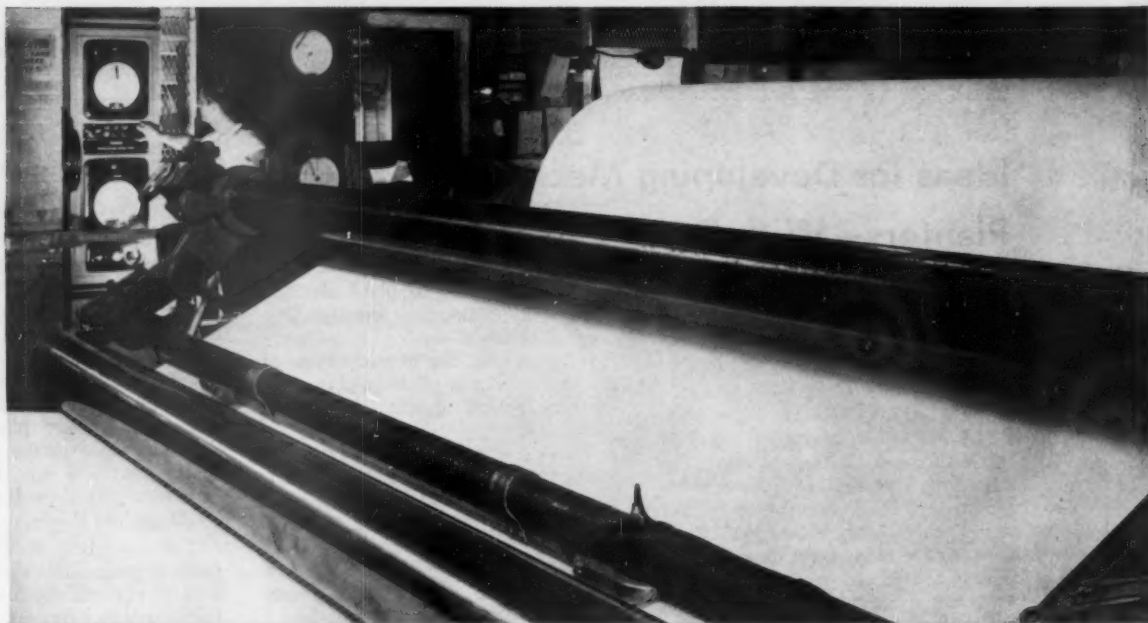
The land, usually a poor type of sandy soil, had to be prepared by ploughing a shallow ditch 2 - 4 inches deep. Ditches were about 3 ft. apart. The trees were planted in the ditch every two feet. The idea of ploughing is to protect the young tree from weeds which would deprive the tree of nutrition and sun. Two people are necessary for speedy planting by this method. One person operates the spade, usually a man, the other one, usually a girl or a boy, inserts the seedlings into the holes.

The operation is like this: The spade is pushed into the ground about 8-10 inches and the handle is moved backwards and forwards to open up a bigger hole. The spade is then pulled out and the seedling introduced into the hole and held by hand until the spade operator closes up the hole. This operation is done by driving the spade into the ground about 2 inches away from the first hole (on the operator side) and then pushing the handle of the spade toward the tree. You can plant one tree every 10 seconds in sandy soil by this method but it is hard work, especially in the clay type of soil.



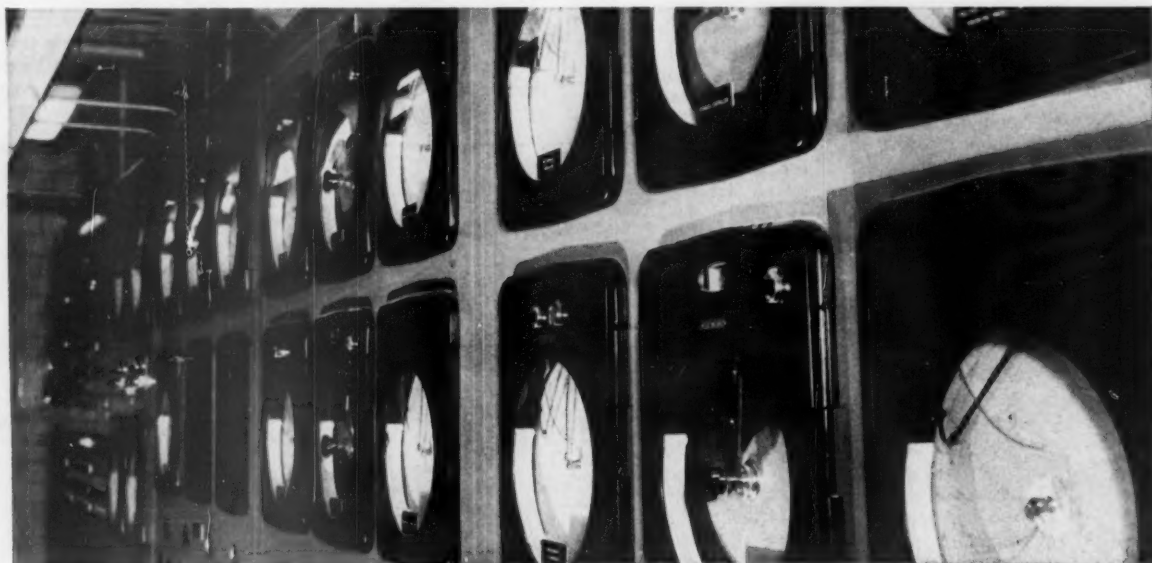
PLANTING BAR USES 4 STEPS. In step I, wedge drives hole and retracts. Step II, tree is placed in gripper and carried to hole. Step III, second wedge moves dirt to seedling. Step IV, gripper releases planted seedling.

Paper-making processes stay



◆ **MOISTURE CONTROL SYSTEM** on #6 paper machine, Hammermill Paper Company, Erie, Pa. Unique Foxboro sensitive element measures 5 feet across paper — provides wide-span average measurement for fully effective machine control. Foxboro moisture control helps maintain paper uniformity — saves on steam as well.

◆ **DIGESTER TEMPERATURES** for Kraft Digester at Bowaters Southern Paper Corp., Calhoun, Tenn. are recorded on these Dynalog Electronic Instruments. To insure best possible digester circulation, Dynalogs record temperature measurements from both top and bottom of digesters. Second pen records continuous measurement of digester pressure. Other instruments on panel are Foxboro cam-set Steam Flow Controllers.



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You'll find Foxboro Dynalog Electronic Instruments at work everywhere in a paper mill — measuring and controlling more than a dozen completely different paper processing variables.

Dynalogs give higher sustained measurement accuracy and greater freedom from maintenance than conventional potentiometers. They are free of drift — require no standardization, lubrication or alignment.

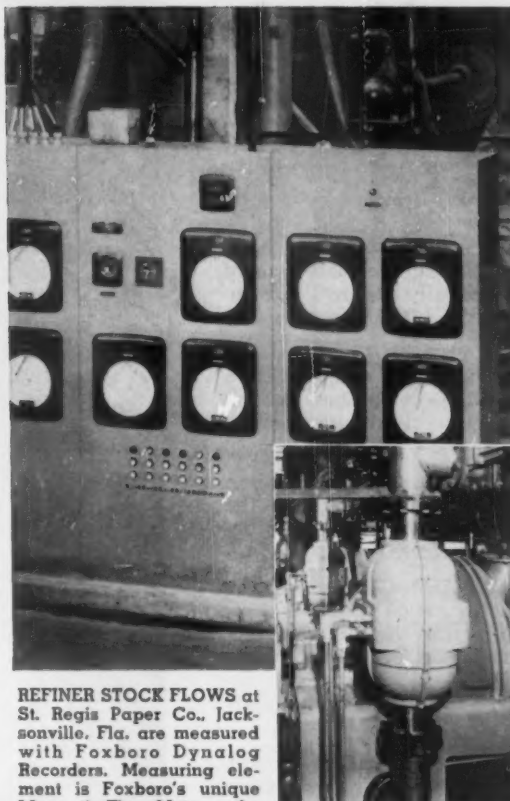
Dynalog design eliminates the slidewire and other moving parts found in conventional electronic recorders. Instead, a simple, variable radio-type capacitor with silent magnetic drive gives stepless continuous balancing. Smooth faster response without waste motion or wear.

For sustained high accuracy and freedom from maintenance, investigate sensitive Dynalog recorders — with fully-automatic pneumatic control action. They can be used for any electrical measurement . . . resistance, voltage, capacity, inductance. Write for Bulletin 20-10 — it gives all the details. The Foxboro Company, 9911 Neponset Avenue, Foxboro, Mass.

*Reg. U. S. Pat. Off.

Other paper-making processes using Foxboro Dynalogs

basis weight control
pH of machine furnish
evaporator boiling-point rise
conductivity for caustic and alum dilution; brown stock washer filtrate
ORP for pulp chlorination; bleach liquor
motor load for refiners, grinders, blow tank agitators
multi-record temperature measurements
density of lime-mud
. . . and many others



REFINER STOCK FLOWS at St. Regis Paper Co., Jacksonville, Fla. are measured with Foxboro Dynalog Recorders. Measuring element is Foxboro's unique Magnetic Flow Meter — the meter with no flow restrictions. Dynalog instruments also insure proper stock blending to paper machines.



SHEET WEIGHT PROFILER measures and records variations in the basis weight of full-width test samples of paper at American Box Board Co., Filer City, Michigan. Dynalog Strip Chart Recorder provides accurate deviation records all the way across the sheet.

ELECTRONIC INSTRUMENTS

FROM GENERAL ELECTRIC'S PROJECT '8000' . . .

Polyseal* Insulated Motors for Use in Pulp and Paper Operations

GENERAL ELECTRIC NOW OFFERS a complete line of open dripproof a-c motors specifically designed to withstand the corrosive atmospheres of pulp and paper applications!

TWO NEW FEATURES—G-E's Polyseal insulation system and added mechanical protection—equip these motors for many operations which formerly required more fully-protected enclosures!

HIGH MECHANICAL STRENGTH—A one-piece, cast-iron frame and corrosion-resistant external parts provide the extra strength and durability required to meet the demands of pulp and paper operations.

NEW POLYSEAL INSULATION SYSTEM—G-E's new Polyseal supported silicone rubber insulation system is completely vulcanized and sealed to resist the contaminating effects of bleaching and black liquor! In addition, these coils undergo rigid factory tests—including G-E's exclusive underwater hi-pot test—to assure positive seals against moisture and other contaminants.

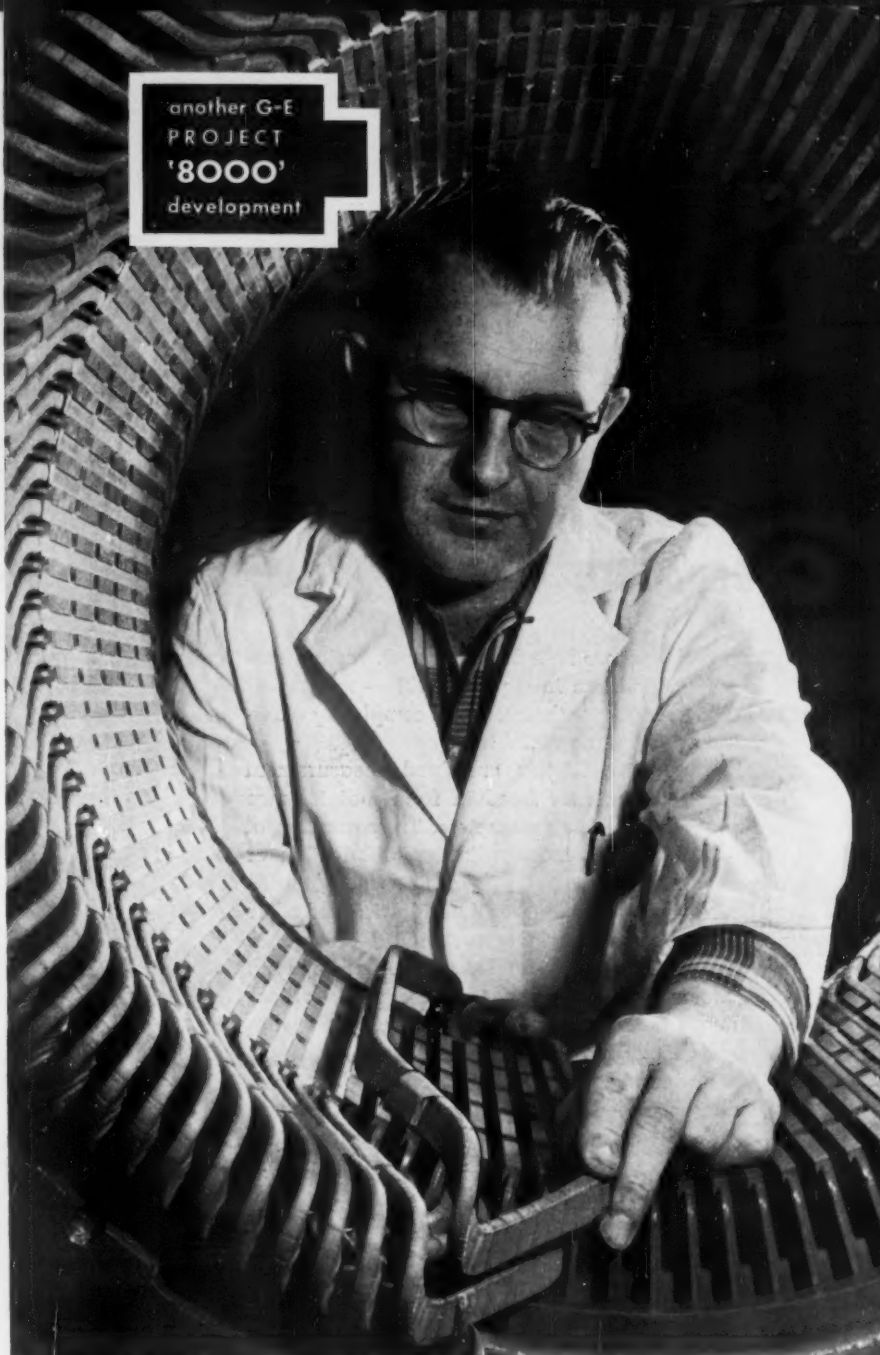
ADDITIONAL PROTECTIVE FEATURES—Gasketed conduit boxes and water-resistant bearing seals also help General Electric motors withstand such extremes as accidental flooding!

FOR MORE DETAILS on G-E Polyseal-insulated Motors, call your nearby G.E. Apparatus Sales Office, or write for bulletin GEA-6889, Section 884-7, General Electric Co., Schenectady, N. Y.

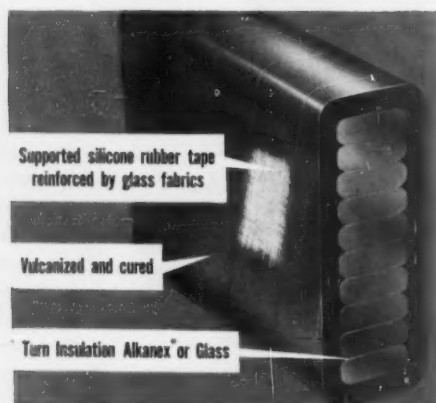
*Trademark of General Electric Co.

GENERAL  ELECTRIC

another G-E
PROJECT
'8000'
development

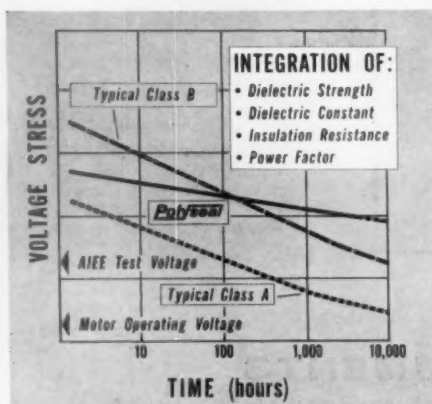


FULLY SUPPORTED



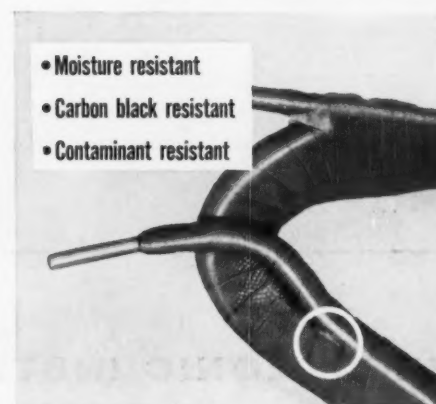
Using specially developed G-E supported silicone rubber tape, Polyseal is the first silicone rubber insulation system on the market that is fully supported against mechanical breakdown.

LONG LIFE



Tested over long periods of time with voltage applied, General Electric Polyseal insulation systems retain a much higher dielectric strength than other commonly-used insulations.

COMPLETELY SEALED



Positive lead seal is provided by a special silicone rubber compound which vulcanizes the lead tubing to the silicone rubber wall of the coil. This seals the coil against contaminants.

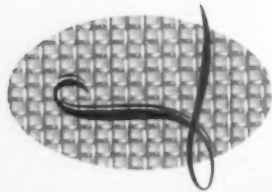


NEW MENTOR PLANT...

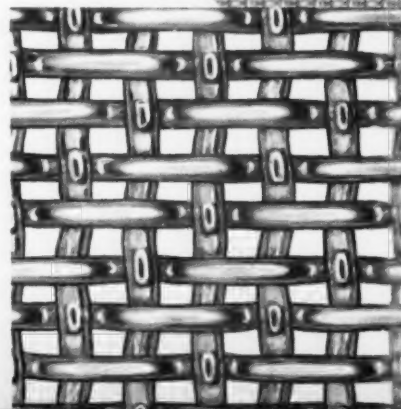
another evidence of Lindsay's Resolve to
expand service as the Paper Industry Grows

Enlarging capacity by more than 25%, the new Lindsay plant in Mentor, Ohio, strides with a notable progress—the progress recorded by the paper-making industry during the past five decades. The photographs herein suggest how all the steps in the Lindsay operation are tied together in one over-all program to insure uniformity and quality. This is true of both research and manufacturing —from strand wire processing and testing through weaving, seaming, finishing, inspection and packaging.

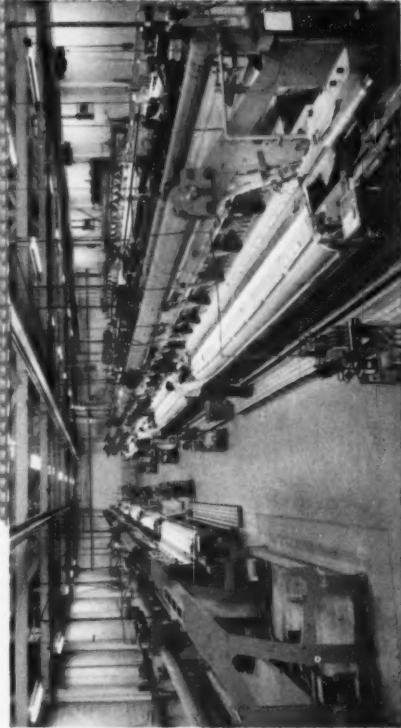




**A third modern plant, in
Mentor, further implements
Lindsay's fixed policy of
manufacturing Longcrimp
Fourdrinier wire cloth
uniform in quality**



Seen above is the Lindsay-designed Longcrimp Fourdrinier wire cloth, which is widely used in the manufacture of paper.



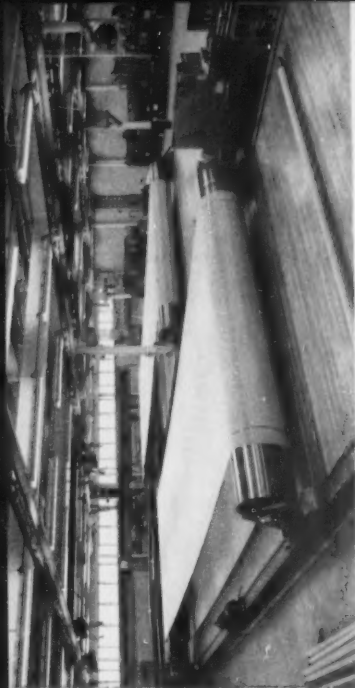
On these modern, high speed looms is woven Fourdrinier wire cloth in a wide range of meshes and in widths from 150 to 350 inches.

"Since 1903"

THE LINDSAY WIRE WEAVING COMPANY
CLEVELAND, OHIO



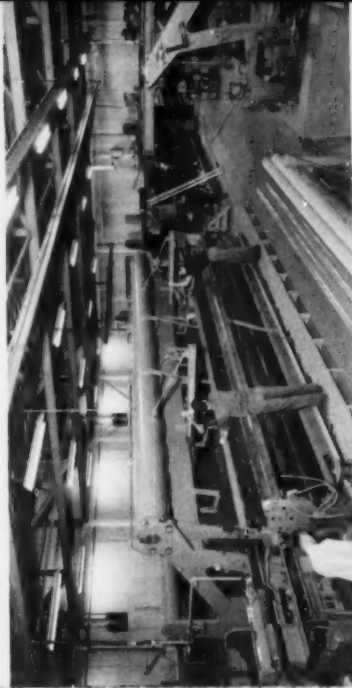
LITHO IN U.S.A.



Finishing, aided by ample room for maneuvering and handling, is just one of a sequence of critical operations marked by extreme care.



This partial view of one loom area includes a section of the Mentor machine shop, where loom parts are fabricated to Lindsay's own design.



Three additional high speed, automatically controlled looms in various stages of construction. Foreground: a 306" loom near completion.

SITE STUDIES IN THE SEABOARD SOUTHEAST

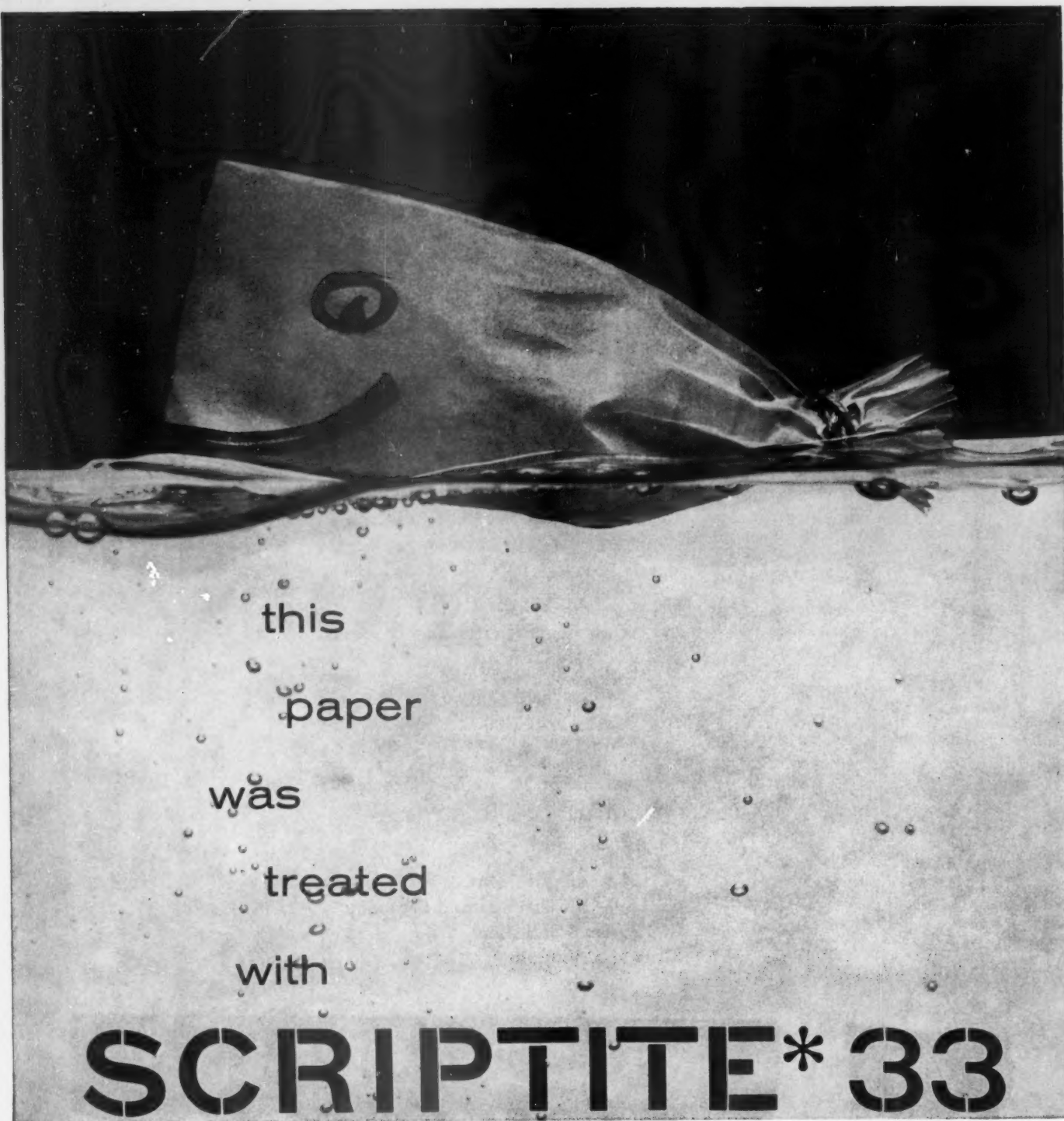
Along the thousands of miles comprising the Seaboard Air Line Railroad system, there are many remaining sites which adequately meet the requirements for pulp and paper manufacture.

It is in this area that the industry has registered such spectacular growth in the past two decades. Timber in the region is in plentiful supply, and numerous streams furnish an abundance of water for processing.

Let us submit details on some of the excellent locations for pulp and paper mills in the Seaboard Southeast.

Address: Warren T. White
Assistant Vice President
Seaboard Air Line Railroad Company
3600 West Broad Street
Richmond, Virginia





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paper
was
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A melamine resin supplied as a finely divided dry powder, Scriptite 33 imparts high wet strength to many paper products. Count on Scriptite 33 to increase dry tensile strength and wet rub resistance . . . to improve dry Mullen, wax pick, internal size efficiency, and dry stiffness. Scriptite 33 produces papers with strong fold endurance. For laboratory samples of Scriptite 33 and technical bulletin, write Monsanto Chemical Company, Plastics Division, Room 1113, Springfield 2, Mass.



*The Monsanto line of paper resins
also includes*

SCRIPTITE 40 . . . a urea type wet-strength resin.

SCRIPTITE 50 . . . for unsurpassed printability and improved surface characteristics on boxboard.

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SCRIPTITE 54 . . . for outstanding water resistance and both wet and dry rub resistance.



*SCRIPTITE: Reg. U.S. Pat. Off.

Northeast

MILLARD M. MUNTZ steps up as quality control mgr., P. H. Glatfelter Co. OLIN V. HYDE has been promoted to chief of the quality control engineering section; KENNETH S. WHISLER becomes chief of the inspection and testing section; CLEO A. BORTNER takes over as inspection foreman in the paper mill. DONALD A. YATEMAN, paper chemist, becomes supervisor of paper research.

T. N. KNOX succeeds C. W. GALLUP, who has retired as director of purchases for New York & Pennsylvania Co. Inc. JACK B. BRYERTON, asst. to the vice pres. and treasurer, moves from the Lock Haven mill to the New York office.

RICHARD E. SITZER and GEORGE S. SERRA have been elected controller and asst. controller respectively of Hurlbut Paper Co. . . . DR. CHARLES R. WITSCHONKE has been named mgr. of paper chemicals research for American Cyanamid Co.'s industrial chemicals div. and will direct research on synthetic resins, wax emulsions, sizing agents and special chemicals. . . . EDWARD R. HEINTZ is now mgr., dyestuff industry sales, and OTTO F. HABEL, product line mgr., vat dyestuffs, for General Aniline & Film Corp.'s Dyestuff & Chemicals div.

JOE SIMONETTE, storage man at Kimberly-Clark's Niagara Falls No. 2 mill, had an experience he won't soon forget. He drove to Missouri to visit relatives and a sister joined him for the trip back. She decided to take a nap in the back seat. They stopped in a service station in Dunkirk, N.Y., and after a conversation with



Arthur C. Dreshfield Organizes Paper Research for Glidden Co.

Mr. Dreshfield, for 20 years with Hercules Paper Makers Chemical Dept., and 15 years a consultant in Chicago, will devote his energies and long experience now to the organization and directing of a new Paper Research and Development Dept. in Baltimore, Md., for Glidden. It will work on technical problems relating to use of titanium dioxide for filling and coating paper and board.

the attendant, and servicing of the car, Joe proceeded. He was going along at a fast clip when he noticed a state trooper bearing down from behind. The trooper stopped him and asked if he wasn't to pick up his sister in Dunkirk. Joe said: "What do you mean, she's right here!" But when he picked up the blanket in the back, she wasn't. He hadn't noticed she had left the car in Dunkirk.

L. E. WRIGHT has been named administrative asst. to E. H. JONES, gen. sales mgr. of St. Regis Paper Co.'s Kraft div. R. REID McNAMARA, president of Sealright Co. Inc., was recently honored for 20 years' service with the company. . . .

RALPH W. PETERS, asst. supt. of paper mills at the Kodak Park Works of Eastman Kodak Co., has been named chairman of the New York-Canadian division of PIMA. . . . JOHN L. HENDRICKSON is now controller of Frank W. Egan & Co. . . .

ROBERT H. HOFFMAN is sales representative in the New York district of Goodyear Tire & Rubber Co.'s chemical div., with primary concern for sales of Pliolite.

Appointment of JOHN H. LAVERY as mgr. of the Core, Wrapper & Bindarene div. of International Paper Co. has been announced. He succeeds EDWIN W. BEBIE, who died Sept. 16. Mr. Lavery joined International Paper Co. in 1939. In 1954 he was named asst. mgr. of this division, which position he held until his present appointment.

RALPH A. WILKINS and CHARLES U. HARVEY have been reelected directors of the Fibre Box Assn. Mr. Wilkins is vice pres. of Bird & Son Inc. He has been with Bird & Son since 1923 and was elevated to his present position in 1947. Mr. Harvey, gen. mgr., Eastern div. Fibre Drum & Corrugated Box Div. of Continental Can Co. Inc., was associated with the corrugated shipping container industry in the Midwest for 30 years. . . . HAROLD M. HOLMES becomes head of the newly formed Product Evaluation section of the laboratories at Hammermill Paper Co., Erie, Pa.

A. W. PEABODY has been appointed supervising engineer of the Corrosion Engineering group of Ebasco Services Inc. With the company for 22 years, he has concentrated on a wide variety of corrosion engineering projects for many utility and industrial companies. . . . HARRY S. VANRYPER, widely known in the eastern pulp and paper industry, died August 25. He was sales representative for John W. Bolton & Sons Inc. and its Emerson Mfg. Co. div. and served as a committeeman in PIMA's PenJerDel div. for the last three years.



George A. Graham Joins Waste Paper Utilization Council

. . . as assistant to RALPH KUMLER, manager and secretary. Mr. Graham has been administrative coordinator at the Institute of Paper Chemistry in Appleton, Wis., since Jan. 1, 1948. He took up his new duties at the Council, 122 East 42nd St. New York City, in October. He will live in Mt. Kisco, N.Y. Born in Burt, Iowa, a Coe College graduate, he was with a machinery manufacturing firm in Cedar Rapids, Ia., before joining the Institute. President of the board of directors of the Council is DIETRICH W. BERGSTROM, vice pres. of Bergstrom Paper Co.

The sales dept. of the Eastern Chem. div. of Hooker Chemical Corp., Niagara Falls, N.Y., announces several managerial changes. WILLIAM L. GILLESPIE becomes



Uong

Kukulich

Promotions at Fitchburg

D. D. (DICK) UONG has been named senior vice pres. and director of new product development for Fitchburg Paper Co., Fitchburg, Mass. The Univ. of Maine graduate joined the company in 1926 as a chemist and has held posts as chief chemist, works mgr. and vice pres. of research and engineering. He is also a director of the firm and president of Fitchburg Paper Development Corp. At the same time it was announced that Dr. STEPHEN KUKULICH has been named director of research. He joined Fitchburg Paper in 1958 as technical director. A graduate of the Institute of Paper Chemistry, he had previously been associated with both Neenah Paper Co. and Lee Paper Co.

Strictly Personal

production mgr., organic chemicals, succeeding ROBERT B. BOYD, recently promoted. Mr. Gillespie, with Hooker since 1939, was formerly mgr., sales administration. Succeeding Mr. Gillespie is JAMES S. WALKER, who joined Hooker in 1940 and has been mgr. of technical service. LLOYD S. BOVIER, formerly administrative asst. to the director of research, becomes mgr., market development, and KENNETH R. EWING, formerly a technical service representative, is now supervisor, trichlor-

ethylene. Mr. Ewing succeeds STANLEY A. MATTISON, now Hooker's Washington mgr.

Minneapolis-Honeywell's Industrial Products Group shifts branch personnel, with ROBERT A. WOLFE, former branch industrial sales mgr. at Albany, becoming mgr. at Pittsburgh; EDWARD J. REULBACH JR. of the New York, N. Y. branch office now heading operations in Albany, and JOSEPH H. TOIFEL moving from Youngstown to Columbus, Ohio.



A. E. H. Fair Resigns Presidency; to be Consultant

In a letter to directors of Brown Company, which manufactures pulp, paper and other forest products at Berlin, Gorham, and North Stratford, New Hampshire and at Corvallis, Oregon, U.S.A., Mr. Fair said he did not wish to renew his contract as president and director because he "presently has certain obligations" and intends to "extend further my consulting work in the paper industry, with Brown and other companies".



Laurence F. Whittemore Resumes Direction of Brown Co.

... pending selection of a new president to succeed A. E. H. FAIR, who resigned. Mr. Whittemore, also chairman, announced changes in top management following a study which was conducted by the executive committee: JOHN L. SULLIVAN, of Manchester, N.H., and Washington, D.C., JUDGE CHARLES P. MCTAGUE, Toronto, and GENE TUNNEY, New York.

STUART W. SKOWBO will continue as senior vice pres. and treas. with authority over Treasury, Accounting and Purchasing, and will represent the chairman in his absence. EDWARD H. PETRICK becomes vice pres. and gen. mgr., Paper Division (including kraft pulp mill, paper mills and paper sales). HUGH D. JORDAN, formerly asst. treas. becomes gen. mgr., Sulfite Pulp Division (manufacture and sales of market pulps, Flocc and chemicals). MALCOLM T. MURRAY, vice pres., specialty sales, will become staff vice president in charge of coordinating sales of various divisions. He will be in charge of the Boston office. JOHN W. JORDAN continues as vice pres., gen. counsel and secretary. C. S. HERR, vice pres. woods operations, will in addition assume general management of saw mills. CONRAD T. WALDIE, former asst. to president, becomes gen. mgr. of towel manufacture, conversion and sales. DR. PAUL M. GOODLOE continues as director of research and development. GEORGE CRAIG continues as chief engineer. ROLAND E. FICKETT, manager, special services, becomes Berlin, N.H. asst. to the chairman.

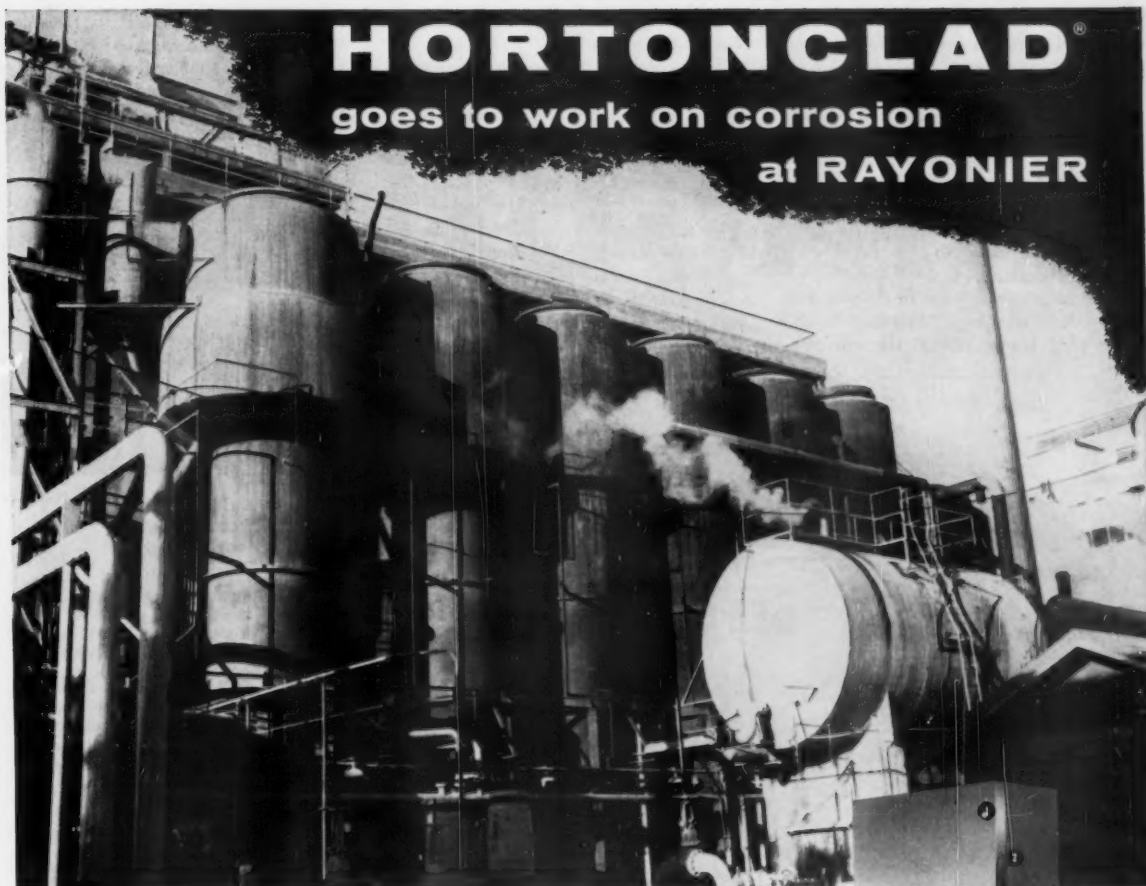
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	Tucson, Ariz.	San Juan 23, P. R.

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HORTONCLAD®

goes to work on corrosion
at RAYONIER



—built EVAPORATOR handles
foam problem on black sulfate liquor

The corrosion-resistant properties of Hortonclad® were employed in the building of this six-body, sextuple effect Conkey® evaporator designed, fabricated and erected by CB&I for the Jesup, Georgia plant of Rayonier, Inc. Stainless steel Hortonclad was used for the No. 1 and No. 2 body, where protection from a high foaming type of sulfate black liquor was most needed. Structures were furnished through Ebasco Services, Inc.

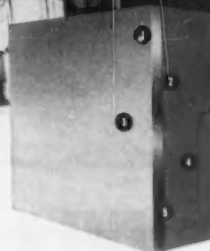
Hortonclad, a CB&I composite metal having an integral and continuous bond, is an example of how CB&I's continuing program of *applied metallurgy* in steel plate construction is helping us—to help industry leaders attain better and longer performance life from storage and process vessels.

Write your nearest CB&I office for a copy of a bulletin which describes the extensive *co-ordinated* services and equipment which we furnish for the paper and pulp mill industry.

Photo above: Compact unitized, "out-of-door" construction such as this, is typical of the way CB&I-built evaporators help insure low installation and erection costs and maximum use of space.

these benefits with HORTONCLAD

- ① Uniform Thickness
- ② High Strength Bond
- ③ Clean, Contaminant-Free Surface
- ④ Adaptability to Any Size or Shape
- ⑤ Special Combinations of Metals



CHICAGO BRIDGE & IRON COMPANY



332 SOUTH MICHIGAN AVENUE

CHICAGO 4, ILLINOIS

OFFICES AND SUBSIDIARIES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

WILLIAM T. McLAUGHLIN has been promoted to field sales mgr. for the Protective Coating div. of Pittsburgh Coke & Chemical Co. Prior to his promotion, Mr. McLaughlin was the protective coatings marketing mgr. . . . MATTHEW J. DELEHAUNTY has been named to the newly created post of market planning mgr. for the mechanical goods div. of United States Rubber Co. He joined the firm in 1922 and in 1953 came to the Rockefeller Center headquarters in New York, N. Y., as mgr. of industrial sales. In 1958 he was named field sales mgr., directing the division's 21 branch offices. He will con-

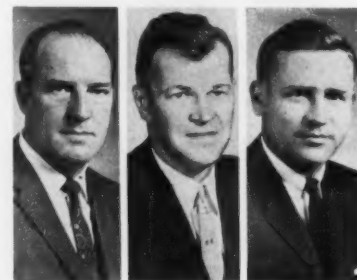
tinue to operate out of the Rockefeller Center offices.

Huyck Felt Co. announces the appointment of FRANK S. WINSHIP as sales engineer. He will cover the Middle Atlantic states.

HENRY W. BAJAK has been named asst. to the president of Arizona Chemical Co. Arizona, a jointly owned subsidiary of American Cyanamid Co. and International Paper Co., is one of the pioneers of the tall oil and sulfate turpentine industries.

. . . JOHN S. KEIR, former chairman of the board and president of Dennison Mfg. Co., Framingham, Mass., died suddenly

Sept. 21. Mr. Keir joined the Dennison organization in 1924, served as president from 1952 to 1957 and as chairman of the board from 1957 until his retirement in March of this year.—Maurice R. Castagne.



Arnold Reed Hewson

St. Regis Reorganizes Technical Activities

St. Regis Paper Co. has reorganized its technical activities "in order to make more effective use of new technology and to implement continuing programs of diversification and growth."

Dr. KENNETH A. ARNOLD as director of research and development is responsible for programs in the fields of pulping, papermaking, coating, polymers, packaging materials, engineering physics, by-products and graphic science. He is a ph.d. graduate of the Institute of Paper Chemistry.

With the announcement it was reported that Dr. ROBERT W. REED has been named director of technical services and control. He was formerly technical director of Rhineland Paper Co., a St. Regis division. THOMAS A. HEWSON becomes director of technical planning. He had served as mgr. of the operations planning dept.



Dollheimer, Chief Engineer for Owens-Illinois Division

FRANZ DOLLHEIMER, a native of Bavaria and a veteran of more than 20 years in the field of pulp and paper, has joined the Multiwall Bag div. of Owens-Illinois Glass Co. as chief engineer.

Mr. Dollheimer, an expert in multiwall bag production, will be responsible for research, development and maintenance with headquarters at Valdosta, Ga. He came to this country in 1927 and became a citizen in 1936. A mechanical engineer, he has been associated with both Union Bag & Paper Corp. and Chemical Packaging Corp.



**BETTER BARKING
BUY MURCO**

MURCO

TRUNNION MOUNTED, MACHINE WELDED, PLATE TYPE

BARKING DRUM

Get clean, "broom" free wood at lower cost from these features:

- ★ **SHELL IS SHIPPED COMPLETELY ASSEMBLED.** Erection time is held to a minimum.
- ★ **SEPARATE DRIVE FOR EACH SECTION.** Each section driven through motor, coupling and reducer. Foundation costs are low.
- ★ **MACHINE WELDED SHELL.** Submerged arc process operated at 750 amps assures deep penetration and absolute fusing yet imparts little strain or stress to the shell. Machine Welding eliminates hand weld imperfections.
- ★ **SHELL IS HEAVY, ROLLED PLATE.** Scallop rings or angle tumblers are welded inside to obtain proper barking action.
- ★ **DOUBLE TRUNNION WHEELS.** Two wheels, cradle mounted distribute load evenly. Perfect alignment minimizes tire and wheel wear.

WELDED IN
OUR FACTORY . . .
NOT IN
THE FIELD

6 SIZES

10' dia. x 30' long.
12' dia. x 30' long.
12' dia. x 45' long.
12' dia. x 67½' long.
15' dia. x 45' long.
15' dia. x 67½' long.

WRITE FOR DETAILS:
Engineering recommendations and proposals covering your requirements will be sent upon request.



D. J. MURRAY MANUFACTURING CO.
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A SKILLED HAND IN CHEMISTRY... AT WORK FOR YOU

NOPCOSANT[®]

...for pitch dispersing

...for slime control

...for size stabilizing

...for coating fluidizing

...for uniform dyeing



You will find it worth your while to get all the facts about Nopcosant—Nopco's newly improved dispersant and solubilizer. Ask your Nopco representative or write for complete information. Remember, too, back of every chemical made by Nopco for the paper industry stands Nopco Technical Service—an experienced staff ready to assist with laboratory data and recommendations based upon your specific requirements.

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PULP & PAPER — November 1959

Properties of NOPCOSANT

A fine powder of uniform particle size

★

Dusts less than any other similar product

★

Lightest colored product of its type

★

One of the most rapidly dissolving products available

★

Most nearly natural pH in its chemical class

PULP & PAPER

Strictly Personal

Southern

JAMES REPLOGLE, who helped engineer the second unit at Rayonier Inc.'s Jesup, Ga. mill, has been promoted to a shift supt. there. New finishing room supt. is ARTHUR MALONE, formerly on the staff at Fernandina. . . . HOWARD E. KINCER has been named supt. of the Lower Paper

Mill at Luke, Md., for West Virginia Pulp and Paper Co. . . . HARRIS BLAKE JACKSON of Jacksonville, Fla., has been named southern sales representative for John W. Bolton & Sons Inc. and the Emerson Mfg. Co. div.

BRAXTON M. (JACK) RYAN, senior representative for Asten-Hill Mfg. Co. and well known in the southern territory, died

recently. Succeeding Mr. Ryan is DAVE ELMORE, Birmingham, Ala. . . . Daniel Construction Co. has opened an office in Atlanta, Ga., at 1401 Peachtree St. NE. Manager is JAMES F. DANIEL III. . . . JEROME HOCHENEDEL has been named asst. mgr. of the Houston, Texas office of the Solvay Process div. of Allied Chemical Corp. E. KENNETH LEINS moves from the division's technical service dept. in



Martha McDaniel Is Named Purchasing Agent, Demopolis

Native Alabamian, born in York, she completed high school in 1940 and continued at Hufstetler's Business School, Mobile, graduating in 1941. Her first employment was with National Gypsum Co., Mobile, continuing for 2½ years. She was purchasing agent for their local office when she resigned.

In 1944, Martha married Leonard (Honey) McDaniel in York. The couple has two children: JOE 14 and TOMMY, three. She returned to work in 1952 as secretary to the executive vice president, Southern Wholesale Lumber Assn., remaining until 1955. In 1956 she was employed by H. K. Ferguson Co., as secretary. She worked for Gulf States resident manager HENRY P. HALSELL and other management personnel during plant construction. In 1957, she became secretary to DAVID C. BOND, then materials control director at Demopolis, where she remained until her promotion to purchasing agent.



Carroll, Production Mgr. at Chillicothe Paper

DWIGHT CARROLL has been named production mgr. at Chillicothe Paper Co., according to N. A. SEIDENSTICKER, president of the wholly owned Mead subsidiary.

Mr. Carroll was formerly supt. of uncoated machine operations at Mead's Kingsport (Tenn.) div. He joined the firm in 1926 and went to Kingsport in 1928, where he has spent all but two of his 33 years with Mead.



Webster Combination Chain is strong and durable—widely used where a serviceable and economical chain is desired.

Pins may be riveted type or provided with cotters. Pins are designed to prevent turning in side bars—distributing wear over full surface of pin inside the long barrel of the link.

Smoothly cored holes assure close fit over pins. Special pattern equipment and tools assure accuracy of pitch and reduce clearances between all wearing surfaces to a minimum.

Rugged steel side bars.

Cast links are made of highest grade malleable iron or Dural which provides 20% greater strength. Available in plain as well as many styles of attachment links to suit your specific requirements.

All Webster Chains are designed, cast, machined and tested in our Tiffin, Ohio, plant.

Webster MANUFACTURING, INC.

DEPT. PP-119, TIFFIN, OHIO

BULK MATERIALS HANDLING EQUIPMENT

Offices in all Principal Cities





**YOU CAN COUNT ON IT—Alpha® Protein improves
quality, speeds production, cuts cost**

Alpha Protein is a chemically isolated soy protein used as an adhesive in producing today's finest coated papers.

Count on Alpha Protein to provide many advantages—in the mill, and in the product itself. For example, the extra solids possible with Alpha Protein give production increases up to 15%...allow less drying time...faster machine speeds...higher coat weights.

In coated papers, Alpha Protein imparts a true-white brilliance...improved opacity...smoother surface...high resistance to water.

Count on Chemurgy Division as a reliable source where careful control through all manufacturing stages insures uniform quality between shipments.

And finally, count on Chemurgy technical men being anxious to give special attention to *your* problem.



**CENTRAL SOYA COMPANY, INC.
CHEMURGY DIVISION**

1825 N. Laramie Avenue • Chicago 39, Illinois

This is a sample of 4-color process lithography on Alpha Protein-processed paper

Syracuse, N. Y., to New Orleans, La. . . . Recently retired is J. M. MURRAY, supt. of production for the Gaylord Container Corp. div. of Crown Zellerbach Corp. at Bogalusa, La.

DAN R. PICHON JR., formerly mgr. of industrial relations for Dierks Paper Co., Pine Bluff, Ark., has been named mgr. of industrial and public relations for Tennessee River Pulp & Paper Co. LAWRENCE T. COKER, engineer with the Hollingsworth & Whitney div. of Scott Paper Co., Mobile, Ala., becomes senior engineer at Tennessee River.

JACK H. REID, previously a sales engineer for Bauer Bros. Co. and American Cyanamid Co., has been appointed sales engineer by John W. Bolton & Sons Inc.

and the Emerson Mfg. Co. div. He will represent the firm in the South and will make his headquarters at Mobile, Ala.

. . . ROBERT CONWAY, for seven years mgr. of the Northwestern div. and pulp and paper mill sales mgr., becomes Southeastern div. mgr. for Walworth Co. . . .

Two appointments have been recently announced by R. J. LODGE, gen. mgr. of Borden Chemical Co.'s Resins & Chemicals dept.: JAMES R. McALLISTER JR. becomes area sales representative throughout the state of Virginia; ARTHUR HAIGH is named technical representative and will headquarter at the southern district office in High Point, N. C. Mr. Haigh, will be working initially in particle board. W. F. Diehl



Peters

Sullins

Clark

Mead Promotes Three at Kingsport Div.

Three changes in the Technical Service dept. of the Kingsport (Tenn.) div. of the Mead Corp. have been announced by V. K. SHANNON, division mgr.

GEORGE W. PETERS, technical service director since 1946, becomes technical asst. to the division mgr., a newly created post. JOHN K. SULLINS is named technical service director, and GEORGE G. CLARK has been named asst. technical service director.

Mr. Peters joined Mead in 1927 and has devoted his 32-year career to various phases of technical service. Mr. Sullins, who has been asst. technical service director since January 1958, joined the company in 1949 and served at Tennessee and North Carolina mills before transferring to Kingsport in 1951. Mr. Clark joined the division in 1951 as a trainee. He was promoted to technical service engineer and has been technical asst. to the gen. paper mill supt. since last December.



Warner

Daneff

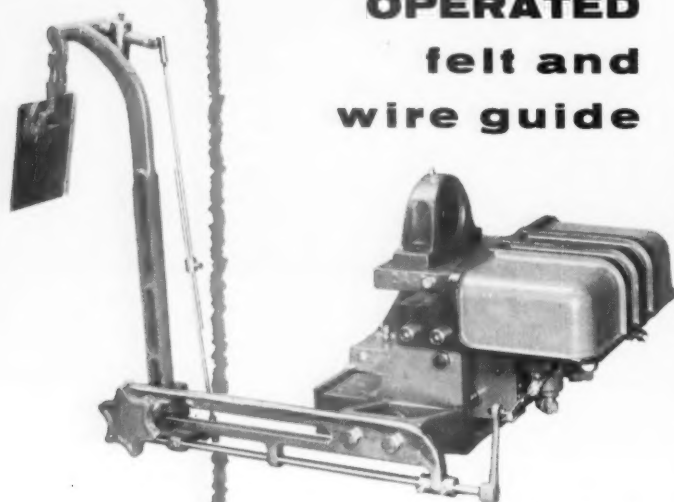
Teare

Champion's Research and Development Division Promotions

ROGER WARNER is promoted to manager of the division's engineering dept., replacing ROBERT FORREST, previously made assistant director of general plant engineering, operations group. PRESTON DANEFF is promoted to electrical research and development group leader. JOHN TEARE is new manager of the division's patent, information and technical services dept., assuming many functions formerly held by T. EDWARD KNAPP, recently named to head Champion Paper & Fibre Co.'s European and licensing division.

IRVAN D. CARBERRY is new manager of business and personnel administration for the division. HAROLD JOINER is administrative assistant to W. PHALTI LAWRENCE, director of research and development. In addition, a chemical products research group has been established to explore possibilities in the production of chemical raw materials, by-products and new products. Named to this new group were CORNELIUS BETTEN, HAROLD JUDD and JAMES STONE.

GILBERT and NASH AIR OPERATED felt and wire guide



New . . . Simple . . . Compact. Now operating on machines at speeds over 2,000 fpm, the Gilbert and Nash Air Guide reacts quickly with reliability and precision.

Although entirely air operated, this new guide uses air only when a correction is made. What's more, "swing roll" effect or guide roll oscillation is completely eliminated.

Guide roll is held stationary if air supply is interrupted . . . there are no springs to pull guide roll with possible damage or loss of wire or felt.

Complete standardization of all guides can be easily accomplished because the same model air guide is used for wires, wet and dryer felts.

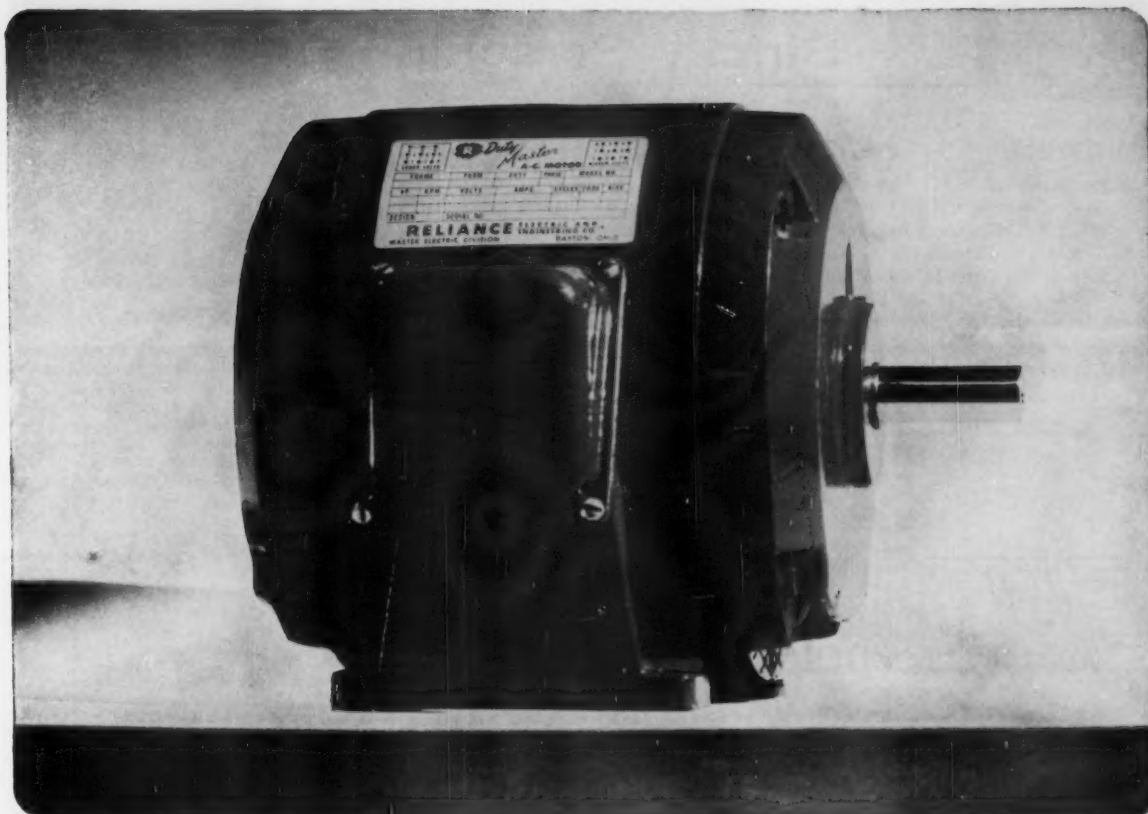
We invite you to request for our representative to call.

Manufactured and sold exclusively by —



APPLETON MACHINE COMPANY

APPLETON • WISCONSIN



DUTY MASTER a brand new a-c. motor

Product of Reliance Electric and Engineering Company and its Master Electric Division, Duty Master's new design gives users better protection from the inside out, simplified lubrication, better response and improved all around performance. The Duty Master line, from protected open, to totally enclosed, explosion-proof, 1 to 250 hp., is ready for delivery **NOW**.

Duty Master's insulation, by means of a series of multiple dips and bakes in thermosetting varnish plus final protection in finishing enamel, makes it resistant to water, acid, dirt and other contaminating elements . . . adds years to motor life.

"Metermatic" lubrication regulates flow of grease to the bearing—provides automatic grease relief. No danger of over-or under-lubrication . . . no maintenance headaches.

Duty Master's low inertia rotor has faster response in starting, stopping and reversing. This, plus better ventilation and increased accelerating torques, permits frequent starts and stops without over-heating.

Duty Master's new design proves conclusively that all a-c. motors are *not* alike . . . that this new motor gives users the best value in industry today.

Call your Reliance Sales Engineer or distributor—listed in the Yellow Pages—for the complete story, or write for Bulletin No. B-2106, Reliance Electric and Engineering Company, 24701 Euclid Avenue, Cleveland 17, Ohio.

B-1636

RELIANCE ELECTRIC AND
ENGINEERING CO.

DEPT. CLEVELAND 17, OHIO
CANADIAN DIVISION: TORONTO, ONTARIO
Sales Offices and Distributors in Principal Cities



REEVES

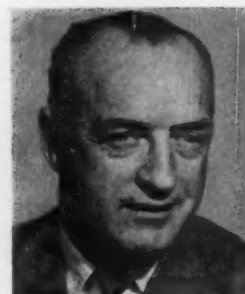


Midwest

Appointment of J. W. McVICKER as asst. to the president and the transfer and promotion of E. C. BECKER to purchasing agent have been announced by Chillicothe Paper Co., a Mead Corp. subsidiary in Chillicothe, Ohio. Mr. McVicker was formerly purchasing agent and traffic mgr., while Mr. Becker was purchasing agent for Mead's Chillicothe div. . . . DR. DAVID G. BRAITHWAITE has been

named to the new post of exec. vice pres. in charge of manufacturing, research and development for Nalco Chemical Co., Chicago. He was most recently in charge of the firm's program of expansion and diversification.

LOUIS DELA GRANGE becomes regional engineer for the Hinde & Dauch div. of West Virginia Pulp & Paper Co. at Sandusky, Ohio. Formerly a field engineer, he will undertake engineering projects regarding equipment and buildings at



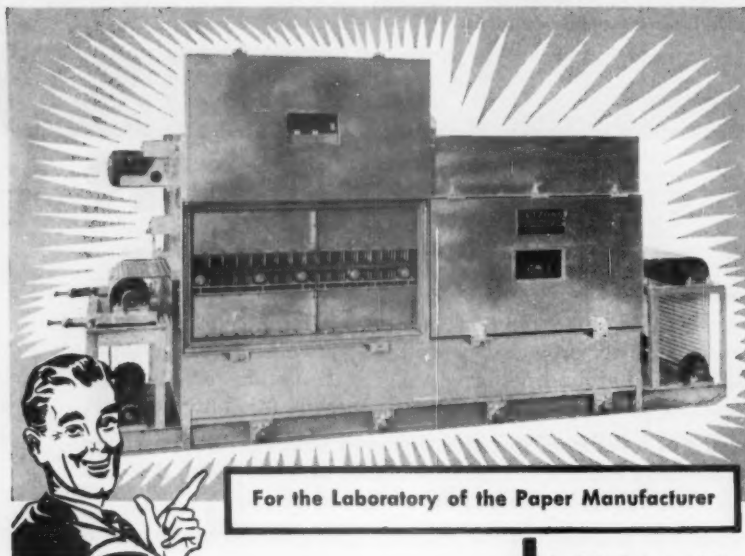
"Mr. Fox River" Retires

HENRY C. KRUEGER, with the firm since 1918, has retired from active participation in the affairs of Fox River Paper Corp., Appleton, Wis. He served most recently in an advisory capacity to the company's regional sales managers, one of whom is his son, CHARLES KRUEGER.

Mr. Krueger started his career with the firm as an office boy. His experience ranged through practically all phases of administrative and executive activity. He served for a time as head of the order dept. and in 1956 became sales mgr. for eastern territory.

Following his retirement, Mr. Krueger joined an investment brokerage in Neenah, Wis., his home.

NEW
JETZONE[®] LABORATORY
and Pilot Plant
HIGH VELOCITY DRYER



For the Laboratory of the Paper Manufacturer

- widens the scope of your pilot operation.
- makes initial runs to test market.
- allows wide range of paper formation and finish.
- opens up new avenues for product development.
- extremely adaptable as a dry and cure unit.
- permits exploration of the new coating techniques.

Write for complete specifications

Available in two models
to handle 24" web.
GAS OR STEAM FIRED!

Model L 4

- Two four-foot long drying zones.

Model L 8

- Two eight-foot long drying zones.

JOIN THE INDUSTRY... INVESTIGATE THE NEW TECHNIQUE OF HIGH VELOCITY DRYING



*A Leader in High Velocity
Drying Since 1946*

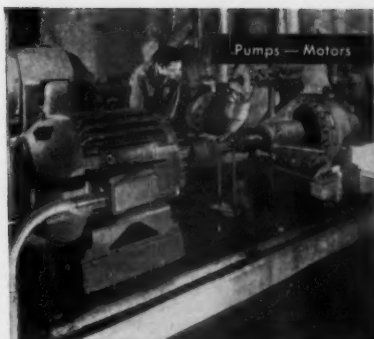
Cleveland, Eaton and Sandusky, Ohio, and at Detroit, Mich. . . . J. J. Koss has been named Milwaukee district sales representative for the Tubular Products div. of Babcock & Wilcox Co. Succeeding him in the Chicago district office is T. J. NAGLE, formerly a district representative in New York. . . . ROBERT A. HANN, forest products technologist at the U. S.



Chisholm Mead Harrison

**Three Elected to
Institute Board**

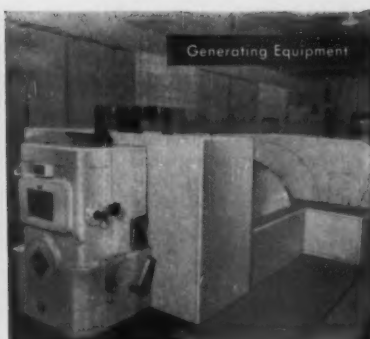
Three prominent members of the pulp and paper industry have been elected members of the board of trustees of the Institute of Paper Chemistry, Appleton, Wis. They are WILLIAM H. CHISHOLM, president of Oxford Paper Co.; STANTON W. MEAD, president of Consolidated Water Power & Paper Co. (both elected to five-year terms), and WARD D. HARRISON, president of Allied Paper Corp. (chosen to serve three years as alumni trustee). Mr. Chisholm and Mr. Mead replace DONALD S. LESLIE, president of Hammermill Paper Co., and GEORGE OLMSTED JR., president of S. D. Warren Co., who were ineligible to succeed themselves. Dr. Harrison succeeds HAROLD BIALKOWSKY.



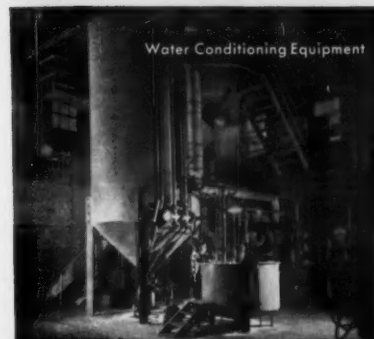
Pumps — Motors



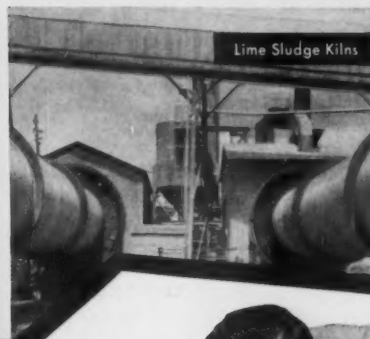
Vibrating Screens



Generating Equipment



Water Conditioning Equipment



Lime Sludge Kilns



Control — Switchgear



One man...

**your Allis-Chalmers man... can supply
and coordinate all this equipment — and more**

Pumps, motors, drives, processing machinery, electrical equipment, water conditioning equipment, materials handling equipment — Allis-Chalmers builds them all. Much of it is specifically designed for pulp and paper service. All of it is designed to work together. And you get more, much more, than the finest equipment when you specify Allis-Chalmers. The obvious time- and money-saving advantages of single-source buying, and a host of services ranging from preliminary planning to continuous field service, are all yours.

Whether you are contemplating major modernization or the profitable addition of a single machine, the man to call is your A-C representative. His recommendations are backed by the many Allis-Chalmers engineering departments, by complete research and testing facilities, by experience gained in a close working relationship with the pulp and paper industry. *For complete information, contact your nearby A-C sales office or write Allis-Chalmers, Milwaukee 1, Wisconsin.*

ALLIS-CHALMERS



A-5975-PP

Forest Products Laboratory, Madison, Wis., has been selected as the first employee of the laboratory to be awarded a full year of academic training under a special program authorized by Congress in 1957. He will study wood chemistry at North Carolina State College, Raleigh.



Dr. Walter J. Bublit
Three M Co. of St. Paul

After eight years in Research and Development Division, Kimberly-Clark Corp., Dr. Bublit goes to Minnesota Mining & Manufacturing Co. to be research chemist in its fast-growing and potentially important Duplicating Products Division. The sensational Thermofax papers are products of this division. Dr. Bublit is a graduate of the University of Arizona and took graduate work at The Institute of Paper Chemistry. He was chairman of Lake States TAPPI, 1958-9.

WILLIAM L. KORN has been named field sales engineer for Huyck Felt Co., Rensselaer, N. Y. He will work with **PHILIP E. ANDERSON**, sales engineer for Wisconsin, Minnesota and Michigan's upper peninsula. Mr. Korn has been associated with field service and manufacturing three years. . . . The Michigan div. of PIMA (formerly the Superintendents Assn.) has awarded its eighth annual Fred C. Boyce Award to **ROBERT E. PAULGER**, a junior in paper technology at Western Michigan Univ. The \$200 prize was announced by **EUGENE M. BAKER** of National Gypsum Co., Kalamazoo, Mich., division chairman.

LEO A. SCHOENHOFEN, senior vice pres. of Container Corp. of America, Chicago, has been reelected a director of the National Paperboard Assn. He joined the firm in 1940 as asst. to the vice pres. . . .

JOSEPH A. TOIFEL moves from Youngstown to Columbus, Ohio, as branch sales mgr. for the Industrial Products Group of Minneapolis-Honeywell Regulator Co. . . .

MERLE A. HAYWARD, manufacturing vice pres. of Phillips Control Corp., Joliet, Ill. subsidiary of Allied Paper Corp., has been named executive vice pres. and gen. mgr. **GEORGE B. ZEIGLER** becomes Phillips administrative vice pres.

Several appointments and new personnel assignments at the central testing laboratory of the Hinde & Dauch div. of West Virginia Pulp & Paper Co. have

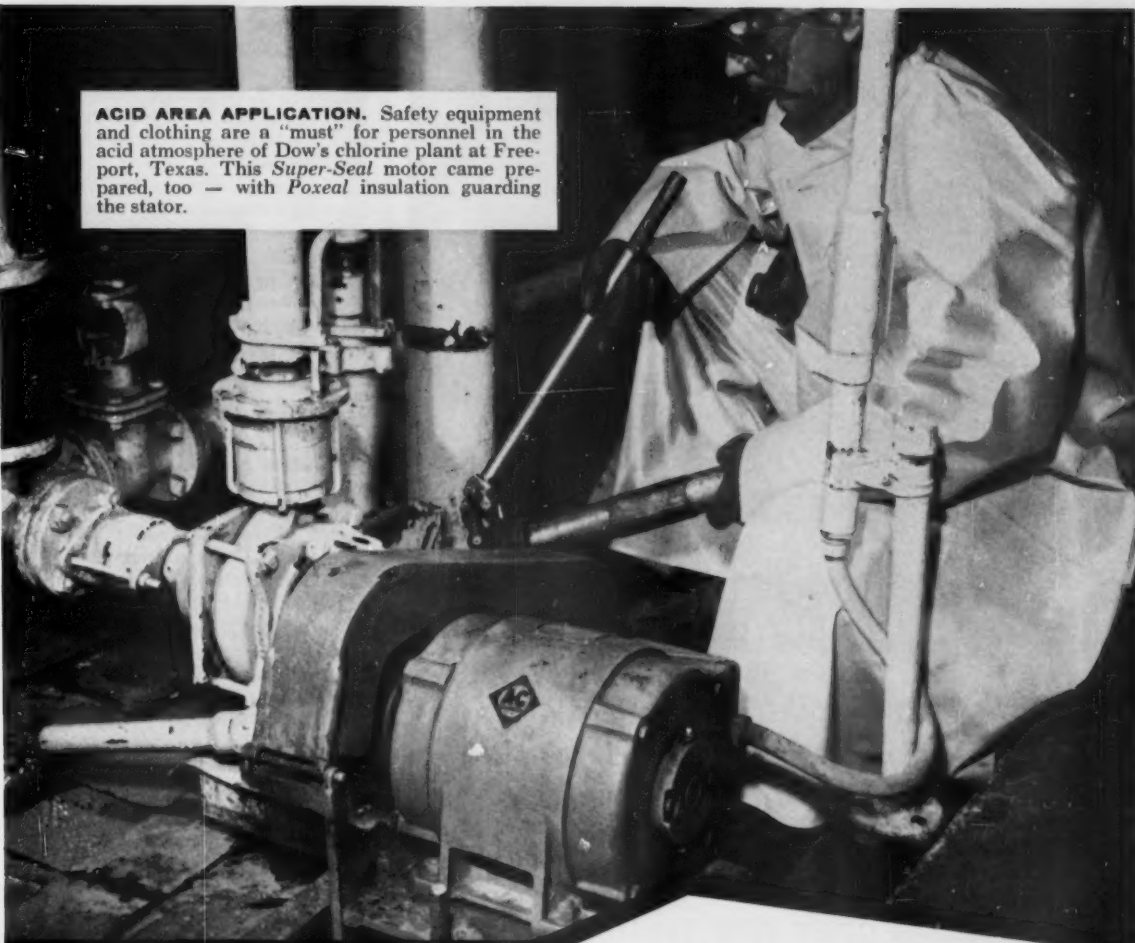


**C. M. Green, Executive V.P.
And Gen. Mgr., Mosinee Mills**

He had been vice president and general manager since 1957 of Mosinee Paper Mills Co. He was elected executive vice president at a recent annual meeting. Increased sales and earnings of Mosinee and its subsidiary, Bay West Paper Co. were reported. Consolidated sales for the fiscal year ended May 31 were \$13,075,663, an increase of 7.8%. Net earnings rose from \$487,554 or \$2.44 per share to \$629,125 or \$3.15. Nearly \$1,000,000 was spent on plant additions during the year. **GEORGE L. RUDER** is board chairman; **NORMAN S. STONE** is president.

been announced by **JOHN R. LITTLE**, divisional technical director. **EDMUND W. CARNEY** is named to the newly created post of development engineer and will be responsible for the development and improvement of materials and processes and





ACID AREA APPLICATION. Safety equipment and clothing are a "must" for personnel in the acid atmosphere of Dow's chlorine plant at Freeport, Texas. This *Super-Seal* motor came prepared, too — with *Poxeal* insulation guarding the stator.



2-year acid test!
Open motor beats
enclosed type at
its own game

In a tough acid pump installation, Dow Chemical's Texas Division experienced no end of motor troubles. It seemed nothing could stand up in that humid, corrosive atmosphere. Reports Dow: "Even with totally enclosed motors, winding failures were frequent." And, they might have added, expensive.

Then came *Super-Seal* motors — Allis-Chalmers open-type motors with amazing *Poxeal* insulation. A durable case of epoxy-resin encloses the winding end turns and slot portions

of the stator... the most complete protection ever developed. Result? The *Super-Seal* motor, after two years of continuous operation in the acid area, is as good as ever. So good, in fact, that Dow has ordered 150 *Super-Seal* motors for a new chemical plant at Freeport, Texas.

Isn't it time to reevaluate *your* motor standards? There's a good chance that costly enclosed motors are no longer needed. Contact your A-C representative or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

Super-Seal and *Poxeal* are Allis-Chalmers trademarks.



ALLIS-CHALMERS

A-1036-PP



You could almost paint in the rain

with new **Carbo Zinc 11***

CARBOLINE'S NEW ZINC FILLED INORGANIC COATING FOR GALVANIC PROTECTION OF STEEL

Becomes water insoluble 20 minutes after application

Sudden rainfall, night condensation or rising tide will not wash it off or affect curing.

Carbo Zinc 11 is not only a new coating, it is a new concept in zinc filled inorganic coatings, with desirable properties not found in other protective coatings. In only 20 minutes the coating becomes insoluble in water. It can be applied directly to damp surfaces, in 90-100% humidity and at temperatures as low as 0°F.

Only one coat provides long-lasting galvanic protection to steel surfaces in marine, coastal and offshore environments. It is also insoluble in organic solvents, and is highly recommended for lining of solvent storage and cargo tanks. And look at its other outstanding characteristics:

- Prevents subfilm corrosion
- Excellent water, brine and solvent resistance
- Economical — low material, surface preparation and application costs
- Does not blister — cures from inside out
- No curing solution required
- Brush or spray application
- In non-immersion service, can be applied over a commercial blast, brush blast or wirebrushed surface

Write today for complete information, technical data, uses and sample of this remarkable new coating—Carbo Zinc 11.



32-O Hanley Industrial Ct.
St. Louis 17, Mo.

*Patent applied for

**Specialists
in Corrosion Resisting
Coatings and Linings**

the investigation of competitive materials. JOSEPH P. GUERRA becomes junior development engineer; FOSTER EWING, at one time with the Battelle Memorial Institute, is assigned to the quality control dept. as technical service engineer for manufacturing, and RUSSELL C. NAGEL, head technician of the testing laboratory, has been named laboratory foreman.

GLENN J. AYRES, asst. sec. and mgr. of the Industrial Service dept., is now devoting his full time as corporate asst. sec. of Northwest Paper Co., Cloquet, Minn. Succeeding him is DR. EDWIN B. WENZEL, formerly asst. mgr. of industrial service and supervisor of training and development. . . . PETER S. VAIL, formerly a sales engineer with Celanese Corp. of America, has been named to the Chicago sales staff of Jefferson Chemical Co. Inc.

S. S. DAVIS, president of Corrugated Container Co., Columbus, Ohio, has been elected a director of the Fibre Box Assn. . . . Some 118 golfers braved showers and threatening skies to compete in the annual outing sponsored by the Miami Valley div. of PIMA. The tournament was held at the Elks' Country Club, Hamilton, Ohio. Prizes were furnished by Black-Clawson Co. . . . DR. IRVING ROSEN, group leader of polymer research in Diamond Alkali Co.'s research dept., Cleveland, was a United States representative



Galloway



Kyle

IUPAC Meets in Munich; Elects New Leaders

Munich . . . The International Union of Pure and Applied Chemistry continued its program for establishment of international standards in its annual meetings held this year in this German metropolis. The Pulp Paper and Board Division of IUPAC elected WILFRED GALLOWAY, research director of The E. B. Eddy Co., of Hull, Quebec, Canada, to succeed HARRY LEWIS, vice president of the Institute of Paper Chemistry, Appleton, Wis., U.S.A., as chairman.

Vice chairman is WALDEMAR JENSEN, head of the Pulp and Paper Research Institute of Helsinki, Finland.

The new secretary is WARD KYLE, research associate of the Institute of Paper Chemistry, U.S.A. GEORGE JAYME of Darmstadt, Hochschule, Germany, KARIN WILSON of Sweden, J. P. VILARS of France, GERMANO CENTOLA of Italy and TOBY RANCE of (Wiggins-Teape) England are other leaders in the Pulp, Paper and Board Division.



MacLaurin



Thode

MacLaurin Goes to Powell River; Thode Heads Institute Section

DR. DON MACLAURIN has accepted a post with Powell River Co., Vancouver, B.C. Canada, in a consulting capacity in connection with their program now under way for construction of the first fine paper mill in the Far West. Dr. MacLaurin, a McGill graduate, was formerly with Powell River in control and technical work after attending McGill University and the Institute of Paper Chemistry. He has been technical director at Gilbert Paper Co. and head of the pulp and paper section at the Institute.

DR. ED THODE is now the new chief of the pulp and papermaking section of Institute of Paper Chemistry in Appleton, Wis. He is a doctor of science from Massachusetts Institute of Technology and was at the University of Maine in the pulp and paper section. He has been in chemical engineering research at the Institute.

to the International Atomic Energy Agency Conference at Warsaw, Poland, early in September. . . . DOUGLAS M. STUART, at one time a technical section trainee at E. I. Du Pont de Nemours & Co. Inc., has joined the sales staff of Jefferson Chemical Co. Inc. He will be assigned to the Cleveland regional sales office.—Don W. Zeigler

Allis-Chalmers Appoints Works Manager West Allis

RUSSELL A. HEDDEN is new works manager of manufacturing, Industries Group, at Allis-Chalmers West Allis (Wis.) Works, succeeding E. W. BONNESS who has been named consultant to the director of manufacturing, Industries Group.

Ed Hilfert, 72, President Of Riverside Paper Corp., Dies

EDWARD C. HILFERT had been president of Riverside Paper Corp., Appleton, Wis., for ten years when he passed away, Sept. 11, shortly before his 73rd birthday on Sept. 30th. He joined Riverside in 1919, after serving in the navy in World War I. He was also a director of Spaulding Pulp & Paper Co., Newberg, Ore., and prominent for many years in Wisconsin paper industry activities.

E. F. DAVIS served under him as executive vice president in recent years.

PULP & PAPER — November 1959



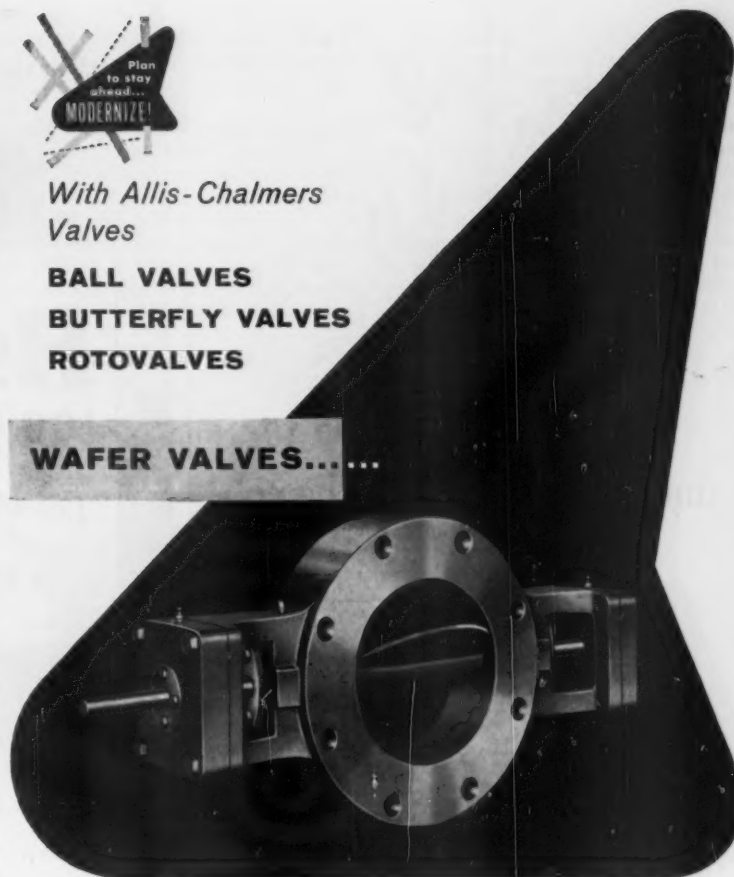
With Allis-Chalmers
Valves

BALL VALVES

BUTTERFLY VALVES

ROTOVALVES

WAFER VALVES.....



Here's a new wafer valve—with Allis-Chalmers full-bodied design—that incorporates many of the highly-desirable features of two-flanged butterfly valves.

Rugged Construction—A-C full-bodied design affords full protection; there is no chance of cracking around bolt holes. Vanes are pinned to stainless or monel shafts with high-tensile pins. Oversized outboard roller bearings and retaining plates are used. Rugged standard mounting brackets provide maximum support for any operator in any position.

Flexibility—Valves can be provided in a wide variety of alloys to handle all types of fluids and semi-solids over a wide temperature and pressure range. They may be equipped with almost any operator, which may be mounted in several positions on standard A-C bracket assemblies.

Through Rubber Seats—Full rubber seats on A-C Wafer Valves afford maximum body protection and positive, bubble-tight shutoff. Standard seats are of natural gum rubber, neoprene or hycar. Other materials are available on request.

Size Range—Full-bodied A-C Wafer Valves are available in standard sizes from 3 to 36 inches in both 125# and 150# A.S.A. series, rated as shutoff pressure of 50# and 125#.

For information on the complete line of Rotovalves, and butterfly, ball and wafer valves, contact your nearest A-C valve representative, or write Allis-Chalmers, Hydraulic Division, York, Penna.

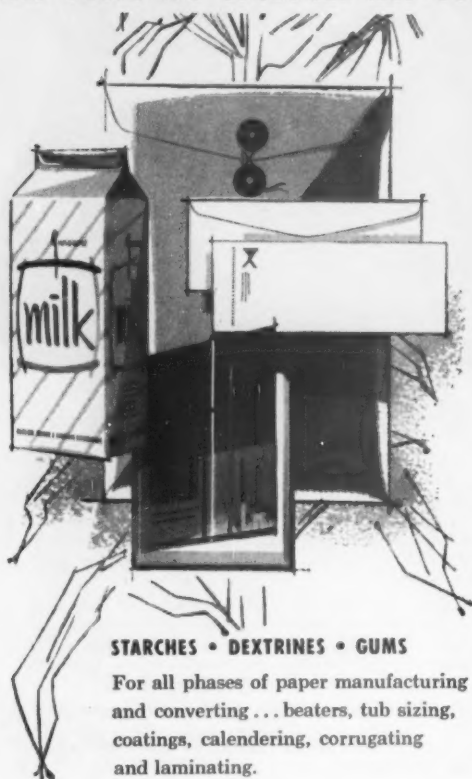
RESEARCH | DESIGN
Hydraulic Division | **HYDRODYNAMICS** | Rotovalves • Ball Valves • Butterfly Valves • Free-Discharge Valves
ENGINEERING | FABRICATION | Hydraulic Turbines & Accessories • Pumps • Liquid Heaters



ALLIS-CHALMERS



Look what happened to
the corn we took off the cob



STARCHES • DEXTRINES • GUMS

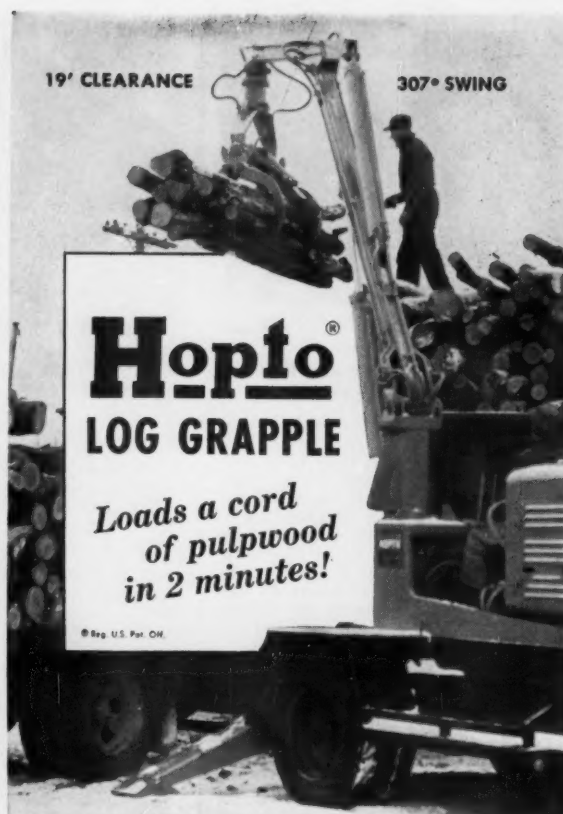
For all phases of paper manufacturing
and converting . . . beaters, tub sizing,
coatings, calendering, corrugating
and laminating.



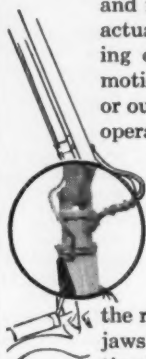
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Pulpwood handling is fast, easy, low cost with Hopto's 19' clearance, 307° uninterrupted swing and fatigue-free operation! Convenient, easily-actuated controls give Hopto a 20 second loading cycle. Hydraulic cushioning makes every motion *safe, sure, exact!* Hydraulic stabilizers or outriggers are independently controlled from operator's position. Set-up time is just 30 seconds!



**GRAPPLE ROTOR LINES UP THE LOAD
WHILE BOOM IS SWINGING**

Heavy-duty, large capacity hydraulic system makes possible a combination of movements. Boom swing, its elevation, the rotation of grapple, and opening of grapple jaws are simply and easily handled at the same time! Hopto is ready for another load at the end of its fast, safe, cushioned swing.

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Please send me all the facts on the Hopto 307 Log Grapple

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Schlagge



Gibb

Mando Realigns Divisional Responsibilities

Aimed principally at expanding research and development programs, a realignment of divisional responsibilities has been announced by ROBERT FAEGRE, president of Minnesota & Ontario Paper Co.

WILLIAM H. SCHLAGGE, gen. mgr. of the International Falls, Minn. paper and Insulite plant, is named to the newly created post of director of research for pulp and paper.

Succeeding Mr. Schlafge at International Falls is GEORGE G. GIBB, director of industrial relations at the Minneapolis headquarters. New industrial relations director is C. R. BINGER, asst. to the president.

In the past, central research activities under DR. JOHN BURTON have been spread over projects in pulp and paper as well as in Insulite board and a broad range of related building activities. Dr. Burton has been named director of research for Insulite and related products.

New Waldron-Hartig Division of Midland-Ross

ROBERT J. JACOBS, general manager of John Waldron Corp., a subsidiary of the Midland-Ross Corporation, and of Hartig Extruder Division of the same company announces the two organizations have been combined as Waldron-Hartig Division of Midland-Ross Corp. Waldron coaters, laminators, etc., are often used with Hartig extruders.

Dow Sales Director Elected Vice President

DONALD K. BALLMAN, director of sales, has been named a vice pres. of Dow Chemical Co., Midland, Mich. At the same time, C. B. BRANCH, mgr. of overseas operations, was elected to a similar post.

Pacific

FRANCIS FLYNN, res. mgr. at Crown Zellerbach Corp.'s mill in Port Angeles, Wash., has chalked up his 25th year with the firm. . . . JOHN BENNETH, district mgr. for American Forest Products Inc., Portland, Ore., has been named western regional mgr. and as such will supervise APFI's forestry education programs in the West. . . . FRED SADEWIC of Willamette Iron & Steel Co., Portland, Ore.,

becomes president of the Portland chapter of the American Materials Handling Society; RAY HOWERTON of Cascade Mfg. Co. is vice pres.

JOHN D. CASSIDY has been promoted to plant supt. at Kaiser Gypsum Co.'s Fir-Tex insulating products plant at St. Helens, Ore.; he succeeds ERNEST H. SCHAPER, who becomes operations mgr. for all Kaiser Gypsum plants. . . . EVERETT NOLLER, research and developments new products mgr. at St. Louis, moves to Oakland, Cal., as technical service mgr. of the Pacific Coast Container div. of Crown Zellerbach Corp. . . . In another CZ move, RUSSELL LAWTON, supt. of in-

dustrial engineers at the Camas (Wash.) div., is named divisional industrial engineer of the Western-Waxide div., San Leandro, Cal. . . .

Simpson Paper Co., Everett, Wash., has announced the promotion of several quality control men: MAURICE V. EISENMAN, quality control supervisor, becomes quality control director; succeeding Mr. Eisenman is BOB ROBERTS, formerly asst. to the quality control supervisor, and TED KOSCHE succeeds Mr. Roberts. Mr. Kosche was assigned to quality control in 1957.

CHARLES J. NAULTY, associated with the firm since 1936 and at the Los Angeles office since 1946, becomes sales mgr.



new felt facts



On Time: When Wanted!

Dependability is more than a virtue. It's often the difference between profit and loss. Albany Felt takes special pride in the long history of its efficient delivery service. Albany Felts always arrive when wanted. As a result, not a single paper machine depending on Albany ever had to shut down. In safe, rugged shipping cartons (or packaged to your specifications)—Albany Felts always arrive when you want them to arrive. It's just another feature of Albany's First Class service.

Engineering Service
Laboratory Service
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available to you
without cost!

Talk it over with your Albany Felt Sales Engineer →



ALBANY FELT COMPANY

ALBANY, N. Y.

World's Largest Manufacturers of Paper Machine Felts

Strictly Personal



Meyer

Baker

Meyer, Controller of CZ

WILLIAM L. MEYER, formerly vice pres. of Gaylord Container Corp. and for the past two years asst. controller of Crown Zellerbach Corp., becomes CZ controller to succeed L. F. BECKERS, who resigned recently. G. O. BAKER JR., formerly director of timber accounting policy, was named asst. controller.

of the Pacific Southern div. of Link-Belt Co. He will serve as sales mgr. of the Los Angeles plant, Montebello, Cal. He succeeds BENJAMIN M. PRESTHOLT, who has returned to the firm's Caldwell plant

in Chicago, where he will specialize in engineering sales for bulk materials handling equipment. . . . KELVIN C. KELLNER, a sales representative since 1956, has been named sales mgr. for soda ash and lime for West End Chemical Co., a division of Stauffer Chemical Co. In another West End Chemical appointment, RICHMOND M. STAMPLEY, a sales representative since 1957, becomes sales mgr. for salt cake and sodium sulfate. . . . WILLIAM WALLACE MEIN SR., chairman of the board of Calaveras Cement Co., has been elected a director of Flintkote Co. (Calaveras was recently merged into Flintkote).—L. H. BLANKENBURY.

New Directors at CZ

Newly elected as directors of Crown Zellerbach Corp: PETER T. SINCLAIR, exec. vice pres.; G. E. YOUNG, vice pres. for newsprint; KING WILKIN, vice pres. for marketing. Messrs. Sinclair and Wilkin were elected members of CZ's executive committee.



Appointed to Oregon Post

GEORGE H. SCHROEDER, chief forester for Crown Zellerbach Corp., has been named to the Oregon State Board of Forestry by GOV. MARK O. HATFIELD.

Pulpwood

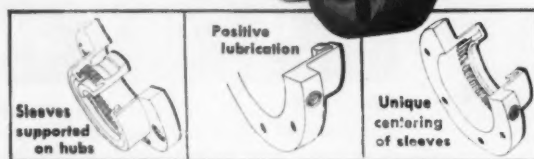
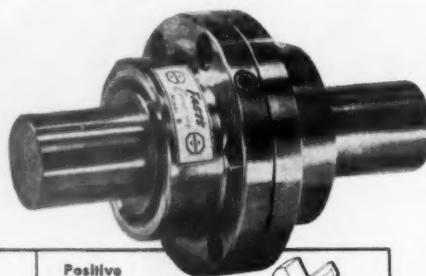
VIRGIL WILLETT, Gulf States Paper Corp.'s conservation forester, has been named 1960 president of the Alabama Junior Chamber of Commerce. . . . WILLIAM MANSON, for several years mgr. of the Salmon River Logging div. of Powell River Co. Ltd., has retired after long service to forestry in British Columbia. H. E. RUARK, Jacksonville, Fla., land acquisition mgr. for Owens-Illinois Glass Co., is new director of the Georgia Forest Research Council.

JOHN C. HORNING, 40, forest statistician for Crown Zellerbach Corp.'s Northwest Timber dept., died recently in Portland, Ore. His father, WALTER H. HORNING, is forestry staff officer for the U. S. Dept. of the Interior, Washington, D. C.

E. E. GRAINGER, with the company since 1946, has been named asst. woodlands mgr. for Abitibi Power & Paper Co. Ltd. The announcement was made by C. B. DAVIS, vice pres.-woodlands. . . . J. J. WILLEY JR., coordinator of timber management for West Virginia Pulp and Paper Co. since 1956, has been named director of forest research and development. He succeeds PETER LANNAN, director of forest research since 1952.

STEPHEN N. WYCKOFF, 68, eminent West Coast forest scientist, died recently at his Berkeley, Cal. home. He served as director of the United States Forest Service's Forest & Range Experiment Station at Portland, Ore., from 1938 to 1945. Prior to that he was in charge of the Bureau of Plant Industry's bitter rust control office in Spokane, Wash. A pioneer in forest genetics, Mr. Wyckoff participated in the founding of the Forest Genetics Research Foundation. . . . WALTER J. DAMTOFT, a southern leader in forestry and conservation, has been honored as "the South's first industrial forester." The retired honorary sec. of Champion Paper & Fibre Co. was cited recently at the 18th Southern Forestry Conference sponsored by the Forest Farmers Assn. The meeting was staged in Tuscaloosa, Ala.

FAST'S Model B Coupling



reduces downtime and upkeep for light-to-medium drives!

Now you can profit from the durability and economy of famous Fast's couplings in a smaller and lower-cost version—available in 5 sizes for shafts 1/2" to 3 1/4" in diameter.

The Model B coupling gives you the same features that have made Fast's the world's leading coupling for over 35 years. You get the same trouble-free per-

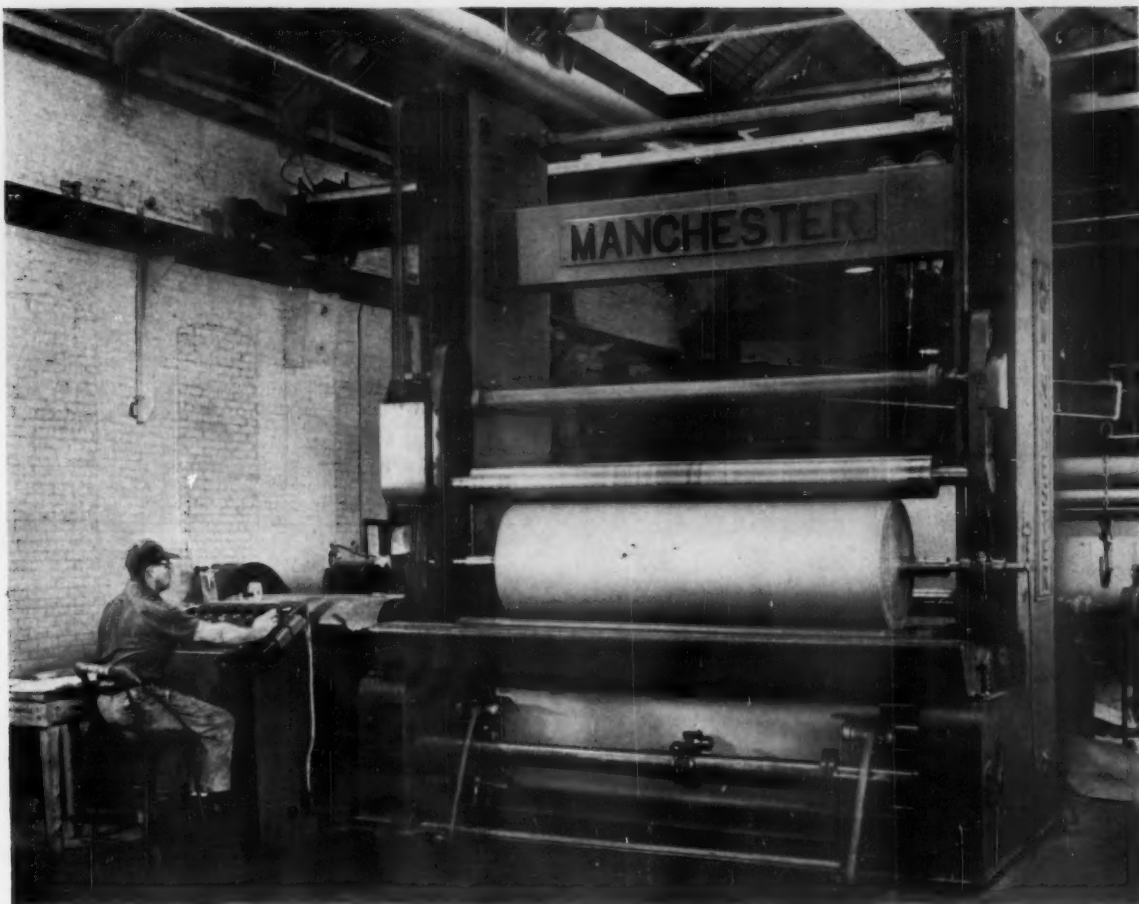
formance, longer service life and lower maintenance costs. You also get prompt delivery because stocks are on hand to meet practically every need. Free engineering service is also available.

Write today for more details to KOPPERS COMPANY, INC., Fast's Coupling Dept., 5111 Scott Street, Baltimore 3, Maryland.

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Sold with Service



THE ORIGINAL
FAST'S Couplings



Here's another profit-making installation
by MANCHESTER MACHINE COMPANY



Smooth, tight rolls every time—low maintenance—trouble-free operation—these are the things that add to paper mill profits. Pictured above is a Manchester winder in operation at a well-known Michigan mill. This was a *repeat order* placed less than six months after installation of their first Manchester winder.

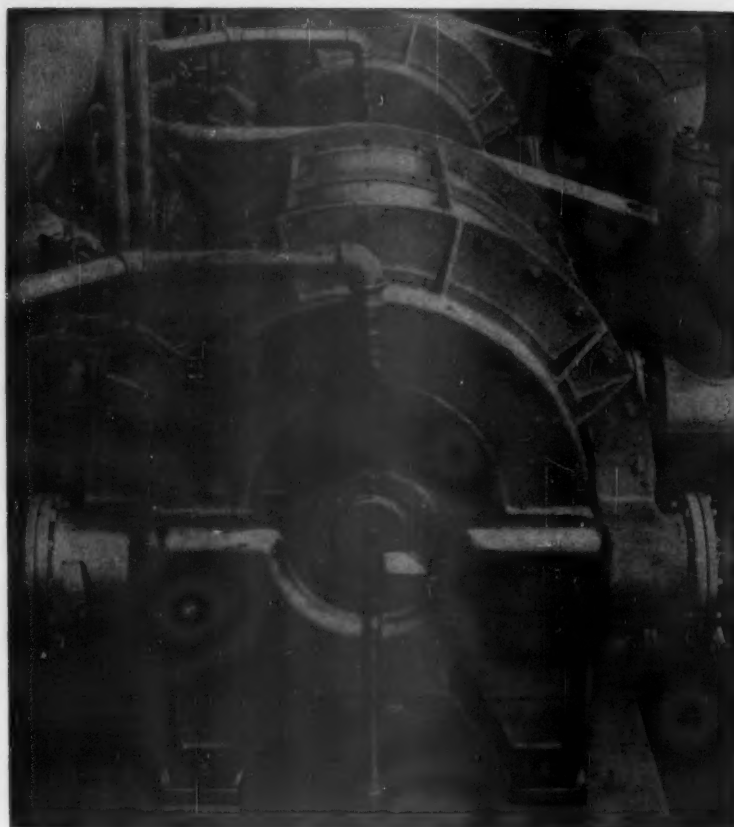
Designed to accommodate 84-inch diameter rolls, this rugged all-steel machine room winder is turning in profit-making performance day after day.

See what Manchester can do for you before you order another winder. **THE MANCHESTER MACHINE COMPANY, MIDDLETOWN, OHIO.**



Manchester Builds Profits for Papermakers

**High machine speeds?
High temperature headbox stock?
You need NASH Vacuum Pumps!**



Air from the suction rolls on paper machines carries with it substantial quantities of moisture. This considerably reduces the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump, because of the unique principle of operation, the bulk of this vapor is effectively condensed inside the pump. The total capacity of a Nash is therefore increased.

When you specify a Nash Pump it can be closely sized to the job. It is not necessary to select an over-sized unit, because the rated capacity of the Nash may be relied upon.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

NASH ENGINEERING COMPANY

441 WILSON ROAD, SO. NORWALK, CONN.



**David D. Hunsaker, Mgr.
Payloader Sales Development**

H. R. BROWN, sales manager, "Payloader" Section, The Frank C. Hough Co., Libertyville, Ill., announces Mr. Hunsaker will be responsible for sales engineering, training aids, product knowledge and merchandising programs. He was formerly a district manager and has been with Hough 14 years.

Canada

LAURENCE B. POPHAM has retired as sec. of Abitibi Power & Paper Co. Ltd., according to an announcement by D. W. AMBRIDGE, president. He is succeeded by CRAIG DICK, formerly asst. sec. and office mgr. . . . ROBERT L. BONAPARTE, who joined Powell River Sales Co. Ltd. in 1958 as marketing mgr., has been made mgr. of the firm, according to R. G. McHUGH, president. . . . R. W. BURGESS has been named to the newly created position of sec. of the Pulp & Paper Research Institute of Canada.

JOHN S. HART, formerly of the Pulp & Paper Research Institute of Canada, has joined St. Lawrence Corp. Ltd. as asst. to W. S. CRAMP, mgr. of the Research & Technical Services dept. He will direct research activities in the field of pulping operations. . . . CYRIL J. HARKE has been promoted to the position of technical supervisor, and DOUGLAS C. REID has joined the staff as personnel administrator at Hooker Chemicals Ltd., North Vancouver, B. C. Mr. Harke was formerly plant chemist, while Mr. Reid was associated with Aluminum Co. of Canada. . . . J. C. ROSS has been named to the newly created post of director of labor relations for Crown Zellerbach Canada Ltd. at the Vancouver, B. C. offices.

JOHN J. HERB, advertising mgr. for Westminster Paper Co. Ltd. at New Westminster, B. C., has been transferred to the Chester, Pa. head office of Scott Paper Co. as product mgr. in the advertising div. R. C. BROWN, formerly retail product group mgr. at Scott, becomes marketing mgr. for Westminster. Mr. Herb is a son of the late E. M. HERB, former president of the firm who died in 1958, and thus represents the third generation of the Herb family in the organization. His grandfather founded the business in the 1920s.—C. L. Shaw



Gray

Kraske



Barber

Meighen

Gray Heads Paper Firm; Kraske is Planning Coordinator

Formation of Columbia Pulp Sales, Ltd., to distribute products of the Prince Rupert, B.C., mill of Columbia Cellulose Co. and the new \$50,000,000 mill now under construction for the companion Celgar Ltd., at Castlegar, B.C., is announced by pres. T. N. BEAUPRE, of Columbia Cellulose Co. W. E. DUGGAN GRAY, formerly manager pulp sales for Columbia, has been named general manager of Columbia Pulp Sales Ltd., with head office in the Burrard Building, Vancouver, B.C.

The company will maintain a sales office in Montreal staffed by District Managers ALEX H. BARBER and STANLEY A. MEIGHEN. The Prince Rupert mill manufactures bleached sulfite dissolving and high alpha specialty pulps. The Celgar mill will start producing bleached sulfate pulp next spring.

Mr. Beaupre also announces that W. A. KRASKE, staff process engineer for Columbia Cellulose and Celgar, has been promoted to planning coordinator for both companies. He is a graduate of the University of Wisconsin and was with the Institute of Paper Chemistry, Gould Paper Co., U. S. Forest Products Research Laboratory, Scott Paper Co. and Allied Chemicals Corp. before joining Celanese Corp. of America (parent firm of the two B.C. companies).

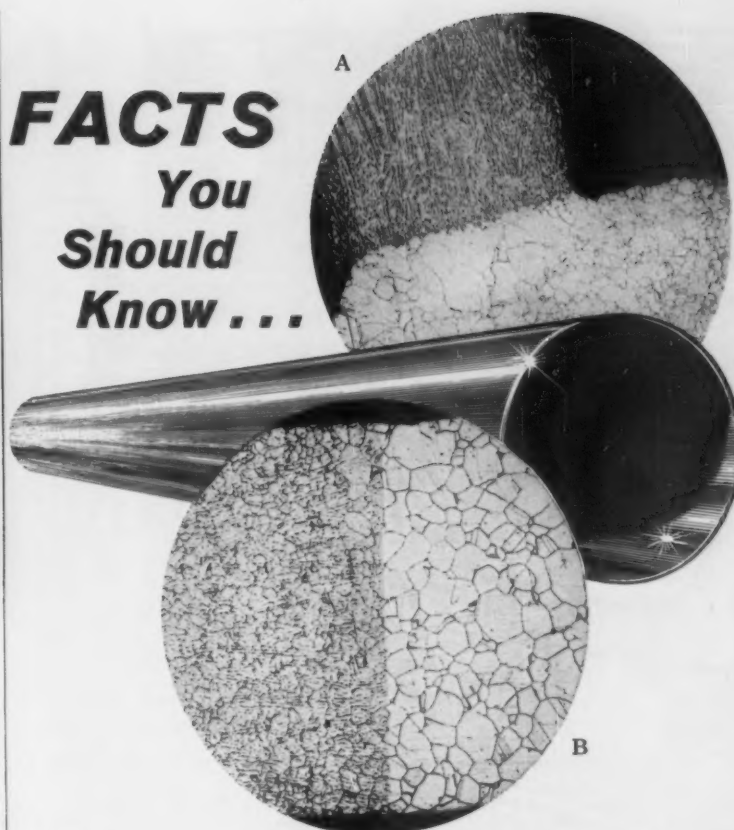
BCFP Appointments

Executive appointments in British Columbia Forest Products Ltd. have been announced by C. D. DICKEY JR., president of the Vancouver, B. C. firm.

T. R. BURGESS, formerly vice pres. for manufacturing and with the company 12 years, becomes senior vice pres. D. E. LANE, mgr. of manufacturing, steps up to the post of gen. production mgr.

D. A. SAUNDERS moves from mgr. of the Cowichan Sawmill div. to the head office as mgr. of manufacturing; W. J. CONNERY, asst. to the mgr. of manufacturing, succeeds Mr. Saunders as mgr.

FACTS You Should Know...



about the DIFFERENCE in Stainless Steel Tubing --

Both photographs above show the microstructure of the weld and base metal of Type 304 stainless steel tubes. Photograph A reveals accelerated corrosion of the weld metal due to the presence of delta-ferrite. This tube was manufactured by welding, swaging and annealing, which is an insufficient amount of cold work to produce a high quality, uniformly corrosion-resistant welded tube.

Photograph B shows a typical tube supplied by Wallingford Steel. This tube was produced by the welding and cold drawing process, then inspected with a Magne Gauge to insure no ferrite was present in the weld metal.

Processed and inspected in this manner, Wallingford Cold Drawn Tube is guaranteed to show no preferential attack in weld area.

All Wallingford welded stainless steel tubing is cold drawn and inspected by Magne Gauge. Can your suppliers say this about the stainless steel tubing they produce? Wallingford's manufacturing techniques and quality control checks assure top quality — yet cost you no more. Why not purchase your tubing where tonnage is produced on a laboratory basis?

*Write for additional information to: Dept. PP,
The Wallingford Steel Co., Wallingford, Connecticut.*

THE WALLINGFORD STEEL CO.

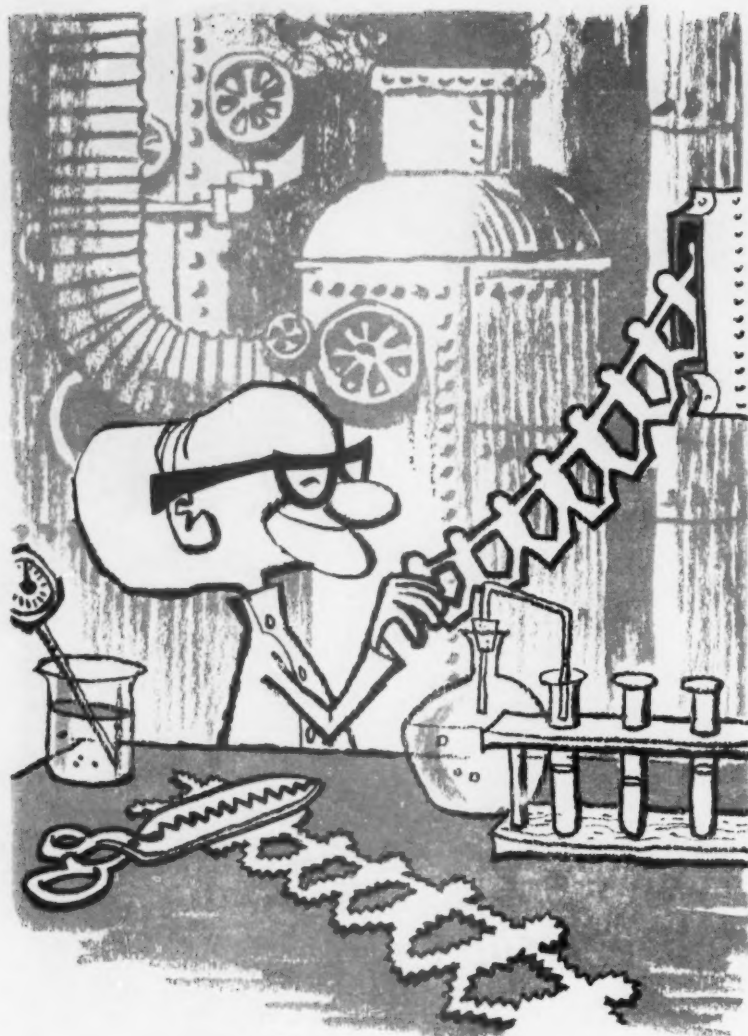


Progress in Metals for over 37 Years

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COLD ROLLED STRIP: Super Metals, Stainless, Alloy

WELDED TUBES AND PIPE: Super Metals, Stainless, Alloy



**The man who knows
his process equipment...
chooses G-B Evaporators!**

To guarantee results such as Doctor Hector's equipment produces is just a little out of our line, but you will find G-B Evaporators in many of America's major paper processing industries.

Men who know their process equipment in the paper, aluminum, sugar and other chemical fields have been specifying G-B Evaporators since 1879.

It would make us very happy to fill your request for facts, figures and case histories of experts who have chosen G-B equipment. All we need is your name and address. Please send.



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**Robert W. Hohman Promoted
By John W. Bolton & Sons**

Since 1956 Mr. Hohman has represented Bolton and its Emerson Manufacturing Division in the Midwest. He is promoted to senior sales engineer. He makes his headquarters in Middletown, Ohio.



**Robert Welsh, Sandoz Dyes
Representative in Far West**

Mr. Welsh recently transferred from Philadelphia to Pacific Northwest to represent Dyestuff Division of Sandoz Inc. He has obtained office space in conjunction with Schaefer Service at 337 Pittock Block, Portland 5, Ore. This direct regional representation is part of a plan to expand national marketing of Sandoz dyes, chemicals, and pigments.



Hartel



Spaulding

**E. D. Jones Enlarges
West Coast Staff**

B. D. (DON) HARTEL, well known to West Coast paper mills, has been named California sales engineer for E. D. Jones & Sons Co., Pittsfield, Mass. He will headquarter in the San Francisco Bay area. At the same time it was announced that BEN SPAULDING will now be able to devote full time to his position as sales engineer in the Pacific Northwest. He may be contacted in care of the West Coast office of Beloit Iron Works, 423 Terminal Sales Bldg., Portland, Ore.



Luis Mulas

A. J. McMullen

Mechanical Packings Will Be Made By Garlock Co. in Mexico City

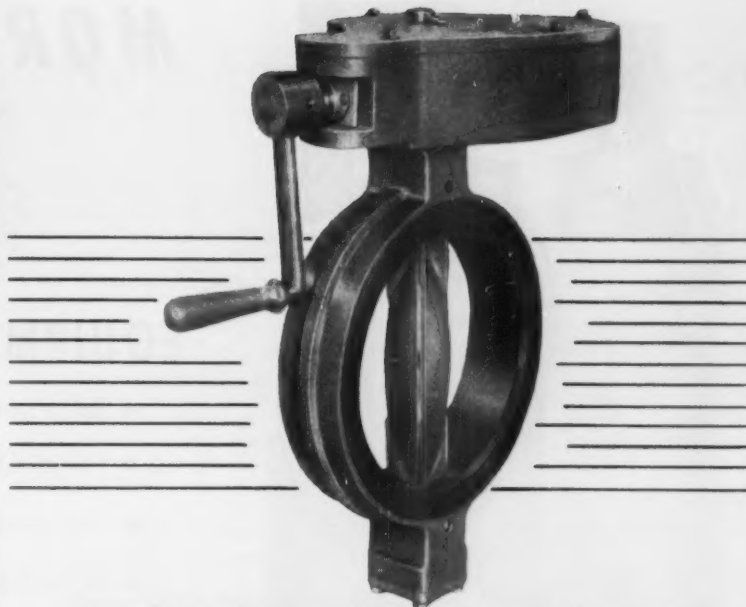
Mexico City . . . Garlock Packing Co., Palmyra, N.Y., U.S.A., has joined with a Mexican firm to manufacture mechanical packings in Mexico City. Garlock de Mexico, the new subsidiary, is the joint venture of Garlock and its Mexican distributor, Luis Mulas, Sucs., S.A. Garlock president McMULLEN says the Mexican enterprise represents a total investment of \$750,000 equipment in the 35,900 square foot plant. Mexico has been Garlock's largest single export market.

About 42% of the Mexican sales volume will continue to be produced at Palmyra or at the company's Plastics Division, the United States Gasket Co., Camden, N.J., U.S.A. Luis Mulas, Sucs., S.A., distributors of industrial equipment, has been the sole distributor of Garlock products in Mexico since 1942. Garlock Packing Co. and Montecatini, S.p.A., jointly own another subsidiary, Marengo, S.p.A. at Spinetta Marengo, 60 miles from Milan.



J. W. "Bumps" Hemphill Joins Singmaster & Breyer, Inc.

J. W. "Bumps" Hemphill is to be pulp and paper specialist for the chemical process and metallurgical engineering firm which is now entering the pulp and paper field. Formerly sales manager of Carthage Machine Co. and mgr. of pipe specialties for Johns-Manville Corp., Mr. Hemphill has been prominent in industry association affairs for many years. He was one of the founders and second chairman of the engineering division of TAPPI, serving in that capacity for several terms. Singmaster & Breyer has many years experience in development of first-of-its-kind plants and is an affiliate of The Fluor Corp., Ltd. of Los Angeles. S&B is an integrated engineering organization, whose wide range of specialized skills, Mr. Hemphill says, can be applied to the design and construction of pulp and paper mills. His offices are in the Greybar Building, 420 Lexington Ave., New York 17.



NEW! Monoflange valve is guaranteed drop-tight at 150#

The Henry Pratt Monoflange MK II is a top quality butterfly valve that fits between the pipe flanges of a fluid or gas line. **It saves weight, space and labor** because it eliminates a pair of flanges and requires only one bolting operation. **It eliminates gaskets** because the faces as well as the inside of the valve body are covered with rubber permanently bonded to the metal.

Low torque makes the Monoflange easy to operate, especially with Henry Pratt's new **SIDEWINDER** manual operator. Any type of power operator can be used if desired. Structural features include streamlined disc, one piece shaft, chevron packing and Nylon bearings. Various materials available for corrosive liquids.

Standardized and mass produced, this new valve offers famous Henry Pratt quality at a new low price . . . you can't find a similar valve that offers so much in quality or performance.

Complete information available. Water and gas flow data, valve sizing, operator selection in 26 page brochure. An ideal tool for the engineer working with and specifying valves. Write for Bulletin 10 IX.

Creative Engineering for Fluid Systems



Monoflange MK-II
RUBBER SEAT BUTTERFLY VALVE

Henry Pratt Company, 319 W. Van Buren St., Chicago 7, Ill. • Representatives in principal cities



At Appleton Machine, the smallest to the largest roll presses in the country turn out the industry's finest finishing rolls in every size and filling. Whatever your superfinishing or embossing problem, there's an Appleton answer. Try us.

APPLETON MACHINE COMPANY
APPLETON, WISCONSIN est. 1883

MORE PROFIT

WITH



EQUIPMENT

- SAWMILLS & ACCESSORIES
- HYDRAULIC LOG TURNERS
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- POWER UNITS
- HYDRAULIC FEEDS
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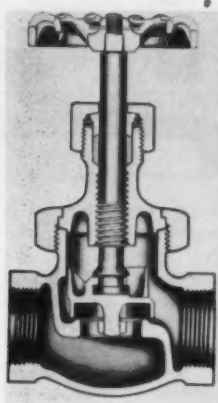
Additional Domestic and Foreign Dealers for Frick Equipment Desired.

or write direct to . . .



Bronze Valves

... to Replace Former Line



Applications: For controlling the flow of liquids, gases, etc.

Advantages: The No. 229 C 200-lb. bronze globe valve and the No. 239 C 200-lb. bronze lift check valve (replacing Nos. 212 C and 218 C respectively) have integral body seats with a semi-crown face instead of screwed-in seats. The disc holder on the new globe valve is of the slip-on type. It is said to make possible fast and easy repair by either the insertion of a new composition disc or the replacing of the disc holder and disc as a complete unit.

Specifications: The valves (1/4-in. through 2-in.) are regularly furnished with No. 4 Cranite discs. This disc is suitable for high-pressure steam of up to 450° F. When ordered for cold water, air, gas, oil or gasoline, the valves are furnished with a No. 6 disc.

Supplier: Crane Co. 836 So. Michigan Ave., Chicago 5, Ill., Tel: WA 4848 2-3123; and Crane Co. Ltd., 15-16 Red Lion Court, Fleet St., London, England.

Horizontal Smoothing Press

... a New Design Approach

Applications: For installation in paper machine dryer sections at approximately the same position where a horizontal size press is usually located.

Advantages: This horizontal smoothing press and breaker press is said to represent an entirely new design approach. The smoothing press can be converted to a horizontal size press by the simple expedient of changing from

two hard rolls to one hard roll and one rubber-covered roll. The design makes possible arriving at an entirely new approach in that the installation of two horizontal units in sequence results in using either unit as a smoothing or sizing press. The possible combinations: (1) double sizing, (2) double breaker operation or (3) the conventional breaker-followed-by-surface-application operation.

Supplier: Patton Mfg. Co., 1802 W. Pleasant St., Springfield, Ohio, Tel: FA 4848 3-5595.

Water Testing Instrument

... 24-Hour Sampling Possible



Applications: For automatic recording of oxygen content.

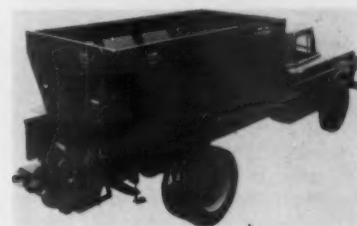
Advantages: The Mark II dissolved oxygen recorder (manufactured in England), connected into one or several intake lines, will automatically draw off a pre-determined water sample, test it immediately and record its findings on tape. The sample is drawn directly from the water source, eliminating the usual time lag and guaranteeing that the water tested has not been polluted in transit to the laboratory. The Mark II can be set to draw from as many pipe lines as desired in rotation, testing each in turn and returning to the original source, continually repeating the cycle. After the sample is drawn into the testing container, necessary reagents are added, the mixture meanwhile being stirred. Automatic devices assure precise amounts and control of timing. Titrating fluid is then added and the record printed on tape showing date, time and dissolved oxygen content. The unit flushes itself automatically and cleans all parts thoroughly.

Specifications: Height: 4 ft. 3 in.; width: 2 ft. 3 in.; depth: 1 ft. 8 in.; expected cost: between \$5,000 and \$7,000. (U. S. deliveries expected early in 1960.)

Suppliers: Baird & Tatlock Ltd., 14-17 St. Cross St., Hatton Gardens, London, England, Tel: HOL 2613; and Chicago Apparatus Co. (exclusive American distributors), 1735 No. Ashland Ave., Chicago 22, Ill., U. S. A., Tel: BR 4630.

Mill Sludge Spreader

... Offers "Better Flow"



Applications: To haul and spread material of a damp and dense quality (marl or paper mill sludge).

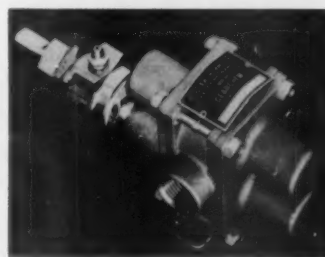
Advantages: Besides the steep sides and formed contour for better flow, the New Leader L-72S features laterally reinforced endgates. A heavy high-carbon steel drive shaft in the conveyor gear case turns the 30-in. conveyor chain. Material is distributed uniformly by 20-in. spinners.

Specifications: The unit is available in four lengths from 9 to 15 ft. with respective capacities of from 5.2 to 8.8 yards.

Supplier: Highway Equipment Co., Dept. P-4, 616 D Ave. N. W., Cedar Rapids, Iowa, Tel: EM 3851.

Pure Nickel Pump

... Prevents Iron Contamination



Applications: For preventing iron contamination of bromines and caustics.

NEW EQUIPMENT

Advantages: The metal to non-metallic gear combination is said to permit pumping of water-thin non-lubricating fluids without seizing or excessive wear.

Specifications: Capacities range to 10 gpm at 1,750 rpm, and the pumps are suitable for pressures to 100 psi. They provide reproducible flows with metering accuracy of $\pm 1\%$. Casings and shafts are pure nickel. Driving gears are nickel or Hastelloy with idler gears of chemically-impervious Teflon.

Supplier: ECO Engineering Co., 12 New York Ave., Newark, N. J., Tel: Market 4-6565.

Integral HP Motors

... in Standard Speeds, Voltages

Applications: For drive power in various industrial applications.

Advantages: The Duty Master integral horsepower ac motors boast a low-inertia, fast-accelerating rotor, which is dynamically balanced to movement tolerances as precise as 0.0002 in. Double-end ventilation is featured on horizontal units above the 180 frame size and through ventilation on all

vertical or flange-mounted horizontal models through the NEMA 445U frame. Metermatic lubrication is exclusive. Insulation is impervious to contaminating atmospheres.

Specifications: Now available in sizes from 1 through 250 hp in protected (open), weatherproof, totally-enclosed, corrosion-proof and explosion-proof enclosures, the motors may be specified in all standard speeds and voltages. Designs include polyphase, ball bearing, vertical and horizontal mounting arrangements with feet or footless, with NEMA C-face, D-flange or P-base brackets. Cast iron frame of the open motors protects from dripping or splashing liquids and has a 40° C temperature rise, continuous duty with 15% service factor.

Supplier: Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio, Tel: REdwood 2-7000.

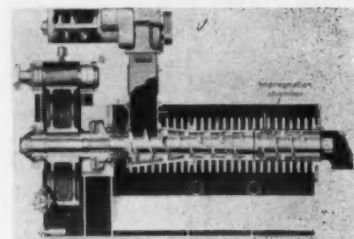
Correction

In the September issue of both PULP & PAPER and PULP & PAPER INTERNATIONAL the suppliers of the Bauer pump-through refiner were erroneously listed. The correct addresses should be: Bauer Bros. Co., 1706 Sheridan Ave., Springfield, Ohio,

U. S. A., and United States Machinery Co. Inc. (for export), 90 Broad St., New York 4, N. Y., U. S. A.

Impregnating Wood Chips

... "in a Matter of Seconds"



Applications: For continuous pressurized impregnation with uniformity.

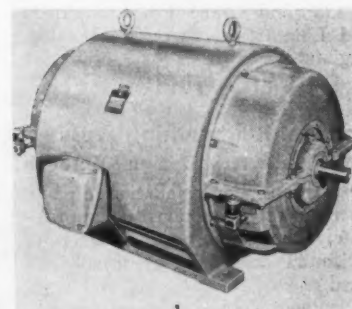
Advantages: The No. 567 Impressafiner is said to accomplish impregnation in a matter of seconds, where an hour or more was formerly required for the cooking or soaking of wood chips. The unit can also be used for precise addition of bleaches and other chemicals; for the restoration of moisture to sawdust, overly dried chips, hogged scrap lumber and similar materials. The screw press action is claimed to soften fiber bonds and thus separate fiber bundles without breaking or shortening the length of individual fibers. Air and moisture are removed by compression.

Specifications: Daily capacity is rated at between 50 and 75 tons. (The Impressafiner is a modification of the Pressfiner, a high-pressure screw press for the removal of liquids and expression of moisture.)

Suppliers: Bauer Bros. Co., 1706 Sheridan Ave., Springfield, Ohio, U. S. A., Tel: FA 3-5501; and United States Machinery Co. Inc. (for export), 90 Broad St., New York 4, N. Y., Tel: WH 3-9811.

Induction Motors

... "Most Complete Line"



Applications: For industrial applications requiring higher horsepower and constant-speed motors.

Advantages: This "most complete line" of redesigned large ac induction

POST DECITRON ELECTRONIC PRODUCTS

Measuring Systems

Model LF-1A

NOW ... MEASURE PAPER BY THE LINEAL FOOT

Now! ... a permanent record of lineal footage. The Post LF-1A Lineal Footage System combines the accuracy of proven electronic equipment with a visual "Clary" readout.

Ideal for accurate measurement for manufacturers of wire, paper, textiles and sheet metals. Sensing elements can be furnished so that measurements can be made in 1/16ths of an inch, 1/8ths, 1/4's or in full inch increments.

Write for literature.

POST ELECTRONICS

Division of Post Machinery Co. | 161 Elliott St., Beverly, Mass.

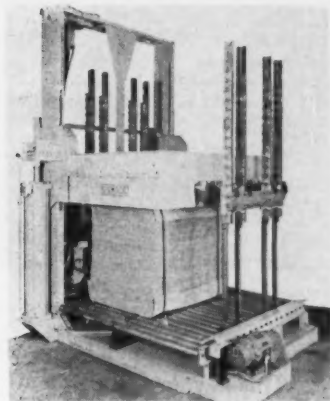
motors is designed to serve as drives for pumps, fans, blowers and compressors. To meet special application demands, several bearing constructions are offered. Inspection and maintenance are said to be easily accomplished.

Specifications: These units in open drip-proof enclosures are offered in ratings of from 150 to 2,000 hp at 1,800 and 3,600 rpm. Bronze inserts are used in the bearing capsule. Anti-friction bearings are utilized in the slow-speed models. A pressure lubrication system is standard on the large units and is optional with the smaller, slower motors.

Supplier: Louis Allis Co., Dept. P, Milwaukee 1, Wis., Tel: HU 1-6000 (ask for Bulletin No. 3350).

Compression Strapping

... Speeds Up Operations



Applications: For numerous baling operations in pulp and paper mills and converting plants.

Advantages: The CSM unit is said to simplify, automate and speed up steel strapping operations, and to produce significant cost reductions for users. The machines compress the load, feed, tension and seal the strap automatically. One operator controls the equipment from a central station.

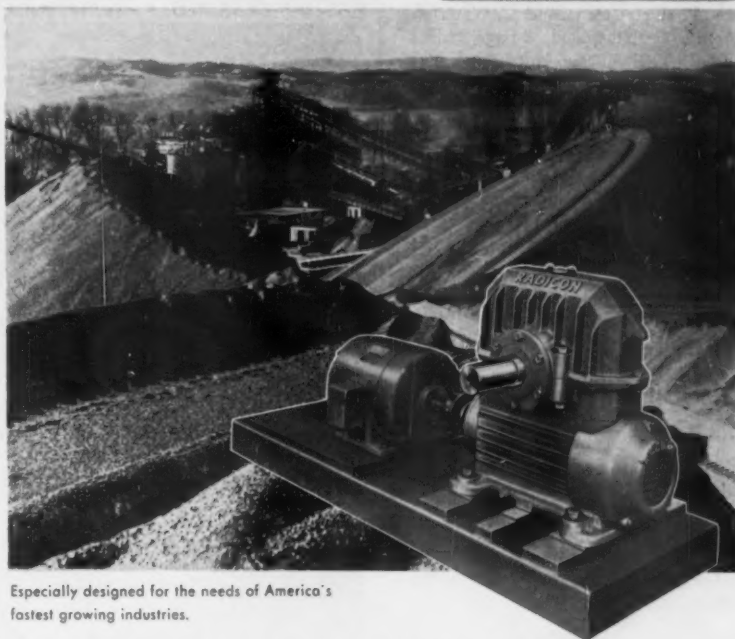
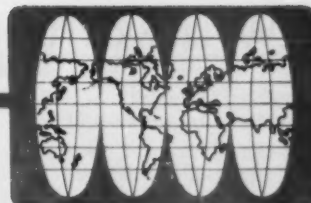
Suppliers: Signode Steel Strapping Co., 2600 No. Western Ave., Chicago, Ill., U. S. A., Tel: ARmitage 6-8500; and Canadian Steel Strapping Co., 258 Wallace Ave., Toronto, Ont., Canada.

Paper Coatings Symposium

The Division of Industrial and Engineering Chemistry of the American Chemical Society is planning a symposium on organic coatings for paper at the Fall Meeting in New York City, Sept. 11-16, 1960. Dr. Harold Wittcoff, Director of Chemical Research, General Mills Central Research Laboratories, Minneapolis, is chairman and is seeking papers.

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around the world



Especially designed for the needs of America's fastest growing industries.

Just Position and Set Six Bolts... the new **RADICON** COMPLETE DRIVES

"Eliminate drive design problems with the versatile new Radicon Complete Drive—just position—set six bolts and you're ready for service."

There's no do-it-yourself involved. Simply select the drive (easy as a gearmotor)—and set! Radicon reducers and motors are already carefully shimmed and aligned on heavy fabricated steel base plates of double box construction, firmly ribbed for rigidity. This means minimum stress at the flexible coupling—low maintenance, with complete versatility for service.

Fan-cooled Radicon Speed Reducers, such as type RHU in the above Complete Drive, are being specified for replacement and OEM in many industries these days. They have learned that Radicons are designed, not for show—but for rugged work in all extremes of temperature, dust, dirt and rain.

Immediate delivery 3" to 12", all standard ratios from 5:1 to 60:1. Radicon complete drives supplied by all authorized David Brown factory branches and distributors.



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Gear Products for: Mines, paper and pulp mills, chemical plants, food processors... conveyors, hoists, agitators, screens, deckers, filters, canning machines, and other industrial equipment.

NEW LITERATURE

Foaming Problems? Some New Answers by GE

For one of the most complete stories ever presented on industrial foaming problems, write to General Electric's Silicone Products Department, Waterford, N.Y. for an illustrated, 8-page bulletin entitled, "G-E Silicone Antifoams". Publication CDS-204.

Bulletin Describes New 18-ton Lorain Moto-Crane, Model MC-218

The crane includes 6x4 carrier with 2 position turntable mounting, hydraulic power steering, power brakes, integrally welded outrigger boxes. Some turntable features covered are one-piece truss reinforced bed, compact clutch shaft assembly, power load lowering anti-friction bearings. Write The Thew Shovel Co., Advertising Dept., Lorain, Ohio.

Consistency Control

"The New Concept in Consistency Control" is the title of a publication that describes the F&P in-line consistency regulator. Discussed in connection with the new method are why it works, where it works and its future application. Write Fischer & Porter Co., 227 Jacksonville Rd., Hatboro, Pa.

Statement required by the Act of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 333) showing the ownership, management, and circulation of PULP & PAPER, published monthly, except in July when publication is semi-monthly at Bristol, Connecticut for October 1, 1959.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: Publishers: Wm. B. Freeman, L. K. Smith, Miller Freeman, Jr., 500 Howard Street, San Francisco 5, California; Editor: A. W. Wilson, 1791 Howard Street, Chicago 26, Illinois; Managing Editor: None; Business Manager: Ralph R. David, 370 Lexington Avenue, New York 17, New York.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, as well as that of each individual member, must be given.) Miller Freeman Publications, Incorporated, 500 Howard Street, San Francisco 5, Calif.; Wm. B. Freeman, Miller Freeman, Jr., 500 Howard Street, San Francisco 5, Calif.; W. E. Crosby, 71 Columbia Street, Seattle 4, Washington.

3. The known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

Wm. B. Freeman,
Publisher

Sworn to and subscribed before me this 1st day of October, 1959.

[SEAL] Barbara M. Hampson,
Notary of the Public,
San Francisco, California

(My Commission expires February 18, 1962.)

another VersaTILE installation

completed for the pulp & paper industry

CUSTOM DESIGNED • QUALITY MANUFACTURED • SKILLFULLY ERECTED



36' x 55' high-density storage tank • The Mead Corporation, Chillicothe, O.

Reflected here is skill and true "pride of workmanship"—typical of S & E erection crews. This is your assurance of a low-maintenance installation on every S & E contract.

Each VersaTILE lining, tank, chest and silo is custom designed to meet the specific requirements of its service. VersaTILE are lustrous-glazed ceramic tile made from S & E dies to meet rigid specifications.



Steel and concrete tanks can also be made corrosion-resistant and contamination-free with a VersaTILE lining.

SINGLE RESPONSIBILITY CONTRACTS . . . anywhere in the world.

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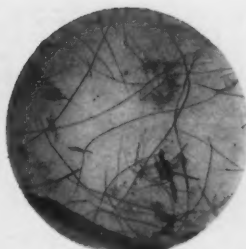
SERVICE & ERECTION CO.

1673A Washington Road Pittsburgh 28, Pa.

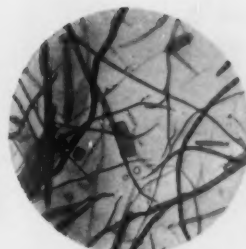
Designers and Builders of VersaTILE Linings and Tanks



WHEAT STRAW



RICE STRAW

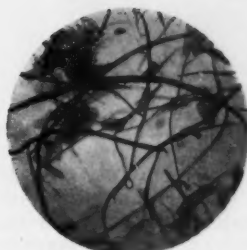


REEDS
(*phragmites communis*)

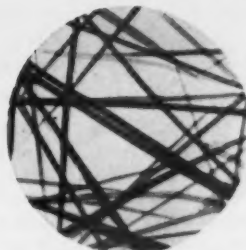


ELEPHANT GRASS
(before cleaning)

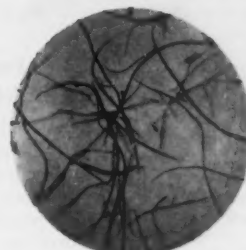
We build pulp and paper mills



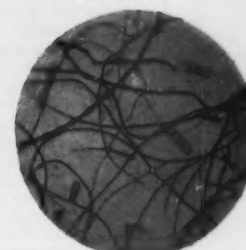
CORN STALK
(before depithing)



SUGAR CANE BAGASSE
(completely depithed)



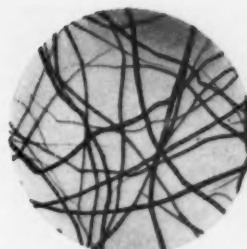
ESPARTO GRASS



BAMBOO

around the world

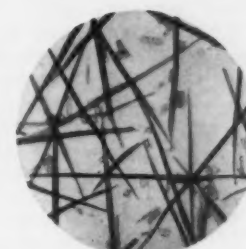
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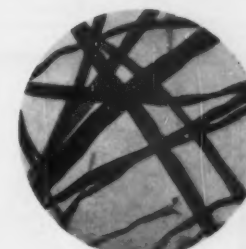
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MANILA HEMP



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MONTEREY PINE

using these locally-abundant raw materials

Many countries have improved their economic position by making pulp and paper from locally-abundant grasses, woods and agricultural fibers. They began by having Parsons & Whittemore conduct a thorough technical and economic field survey. The selection of the proper process and equipment for use of such fibers is dependent upon many factors that can only be properly evaluated by highly-experienced personnel.

Field research is only one of Parsons & Whittemore's serv-

ices. Our organization has world-wide technical, financial and machinery-manufacturing facilities that enable us to plan and supervise the designing, engineering, financing, construction and equipment of pulp and paper mills in any country having the required raw materials. We will even train local workers to operate the mill...and our branch offices will arrange for the sale of the plant's pulp and paper output on world markets. For information on any or all of these services, write to our nearest office.

THE PARSONS & WHITTEMORE / LYDDON ORGANIZATION

World leaders in the development of pulp and paper mills for the use of local fibers

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250 Park Avenue, New York 17, N. Y.

Meet Huyck's **WARD**



Lowell G. Ward, better known as "Lew," is a Senior Research Engineer in Huyck's Development Department. Following his graduation from the University of Delaware he worked nine years for the Armstrong Cork Co. manufacturing latex impregnated specialty papers. At Huyck, "Lew" and his group are working closely with mills throughout the United States to bring the latest advancements in felt construction to all paper-makers.

HUYCK FELTS

First in Quality . . . First in Service Since 1870

**KEEP
YOUR
PAPER
CLEAN**



Doyle PAPER CLEANER

- Assures manufacture of cleaner paper.
- Removes shreds, slitter dust, etc.
- Fully automatic in operation.
- Improves quality of paper products.
- For Sheets or Webs of any size.

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J. E. Doyle COMPANY

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Me? I'm up here learning the pulp and paper business!

B. C. Hails End of 49-day Strike

Although only one pulp mill was affected to the point of shutting down, British Columbia's pulp and paper industry had good reason to welcome the mid-September termination of a 49-day strike in the coastal area's logging camps and sawmills.

Most mills had been able to build up substantial inventories of logs and pulp chips before the strike was called but would have been in critical condition had the tie-up continued much longer.

Operators reluctantly agreed to terms proposed by Dr. John Deutsch, university professor nominated as conciliator by the provincial government. The basis of settlement was a 20-cent an hour wage increase spread over the next two years. The International Wood Workers had originally called for a 20% increase.

Workers lost an estimated \$20,000,000 in wages as a result of the strike, and the loss to the province's economy was much greater because of the effect on associated industries such as towboating and other forms of transportation, supply houses and general business, not to mention delayed and cancelled orders for forest products.

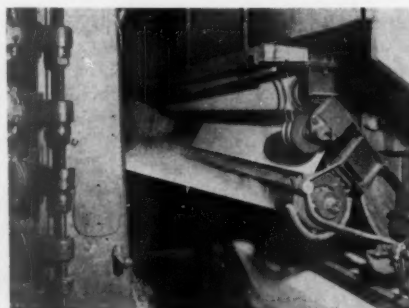
New Seattle Laboratory Serves Industry

Combined effort on the part of two long-time Pacific Northwest firms has resulted in establishment of Fibre Research, an independent research laboratory serving the pulp, paper and board industries. The new organization is located at Seattle.

Cooperating in the joint project were the Pulp & Paper div. of Hill & Ingman and Washington Iron Works.

Technical director of Fibre Research is Edgar G. Putnam, formerly a consultant and a design engineer in the pulp and paper industry. He was instrumental in the initial development of the new Putnam-Greaves continuous pulp digester.

"Our objective," said Mr. Putnam, "is to make available to the industry an independent development, research and testing laboratory. We have both batch and continuous pulping facilities for the production of chemical, semi-chemical or mechanical pulp, as well as TAPPI test equipment for full evaluation. . . . We have installed equipment not ordinarily found in private laboratories . . . and have been told that we have the most complete independent forest products laboratory west of the Mississippi."



Improve Paper Quality with DUPASQUIER DRIPLESS STEAM SHOWER PIPE

- **WET END**—breaks up bubbles, disperses foam
- **DRY END**—increases sheet moisture, improves finish, lowers bulk and caliper
- **SAFELY USED** anywhere dripless steam desired

Custom Built for Any Machine
U.S. Pat. No. 2642314,
In Canada No. 509451

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J. H. DUPASQUIER 560 E. Clarendon St.
Gladstone, Oregon

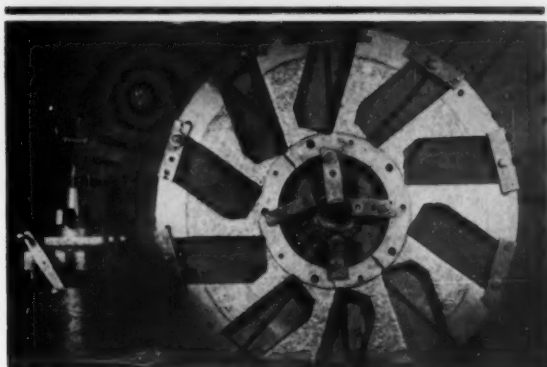


Here's another order of ALASKAN Stainless Steel pipe being prepared for shipment.

STAINLESS STEEL PIPE & FITTINGS
... for the Pulp and Paper Industry

3600 E. MARGINAL WAY • SEATTLE • WA. 3-5800 • TWX SE-392

ALASKAN COPPER
SEATTLE Works WASHINGTON



Colmonoy Hard-Surfacing Cuts Wear Plate Costs

Worn chipper disc wear plates are being reclaimed with Colmonoy No. 5 electrodes at less than a third of replacement cost, and are lasting 2½ times longer than new plates. Plate shown has been hard-surfaced and is ready to be machined. Ask for our Engineering Data Sheet No. 49 and the Colmonoy Hard-Surfacing Manual.

HARD-SURFACING AND BRAZING ALLOYS

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CORPORATION

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MORRISVILLE, PA. • NEW YORK • PITTSBURGH • MONTREAL • GREAT BRITAIN



Speaking of Pulpwood

Did you know there is an Owen Grapple especially designed for the pulp and paper manufacturing field? The independent tine action ... an exclusive Owen patent ... affords greater grabs and larger log loads.

Write today and get convincing facts
and special illustrated pulpwood bulletin
... free upon request.



The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO



Southern Corporation, Charleston, S.C.

FITCHBURG "RESISTO" Stainless Steel Screen Plates

Simple Construction:

Heavy one-piece steel plate.
One-piece Bronze "shock-absorber" grid frame.
Joined with forged-in Inconel rivets. (no welding)

Highest Capacity: Cut with our famous "DUPLEX SLOTS," giving top screening capacity.

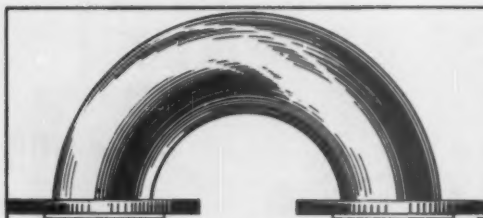
Instantly Interchangeable: With any standard ¾" Bronze plates either Drilled or Beveled edge.
Also available ¾" thick for "T"-Bar installation.

FITCHBURG
Screen Plate Co., Inc.

301 South St., Fitchburg, Mass.



Back view showing
simple, rugged, two-
piece construction.



We Fabricate to Your
SPECIFICATIONS

A.S.M.E. Pressure
Vessels
Smokestacks
Boiler Breechings
Oil Tanks
Chemical Tanks

Stock Tanks
Blow Tanks
Brine Tanks
Fabricated Pipe
Chest Inserts
Laboratory Tanks
Tubing

Fittings
Flow Boxes
Wax Tanks
Float Chamber
Tanks
Reel Stands

FELKERWELD for Endurance. Our more than 40 years' experience in fabricating plain steel, applied to stainless steel when it came into the market enabled us to develop our **FELKERWELD PROCESS** for **ENDURANCE**, with such metals as Stainless Steel, Stainless Clad Steel, Inconel, Monel, Nickel, Copper and Aluminum Bronze. **FELKERWELD** is your guarantee for quality and workmanship.

FINE FABRICATION by FELKER



FELKER BROS. MANUFACTURING CO.
MARSHFIELD, WISCONSIN

Chemical Pulping Processes

The high degree of chemical, mechanical and physical control over materials and operations in the Chemipulp and Chemipulp-KC systems results in maximum plant output, high pulp quality and low operating costs.

- Circulating Systems
- Chip Distributor
- Chip Pretreatment
- Waste-Liquor SO₂ Gas and Heat Recovery
- Independent Recovery System
- Jet-Type Sulphur Burners
- Hot Acid Systems
- Hydroheater
- Spray-Type SO₂ Gas Cooling System
- Acid System (Bubble Absorption)

Chemipulp Process, Inc.

Watertown, N. Y.

Associated with

Chemipulp Process, Ltd., 253 Ontario St., Kingston, Ont.

Pacific Coast Representative

A. H. Lundberg Inc., P.O. Box 186, Mercer Island, Wash.

WISCONSIN WIRE WORKS

Performance under your operating conditions through control of raw material and factors of production—quality thru Automation!

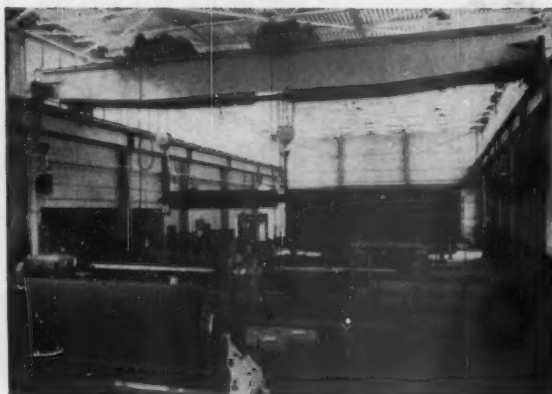
Service to you thru research and technical assistance. Our technical facilities are at your disposal.

Dependence on Wisconsin to perform, produce, and provide when and what you need, assures you of production.

SEE OUR FILMS

"Weaving Wisconsin Wires"
(How a wire is made—from mine to mill)

"These Few Seconds"
(The technical control required to produce a wire of quality)



**Simplify Paper
Roll Handling
Problems with**

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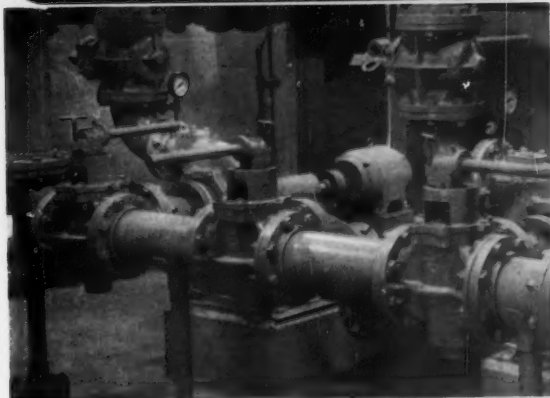
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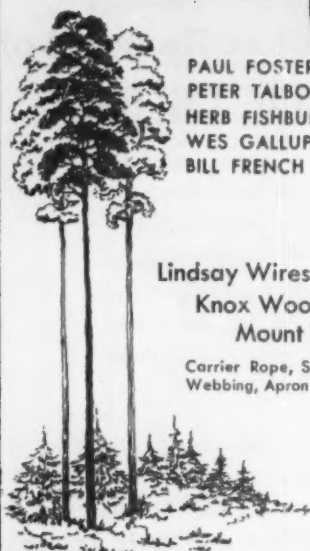
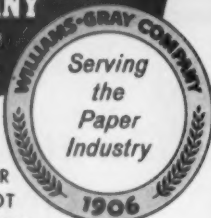
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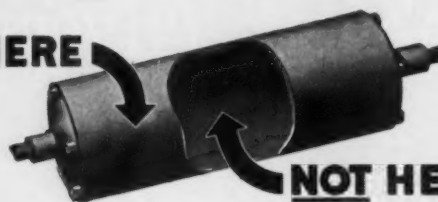
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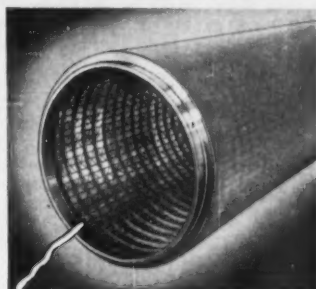
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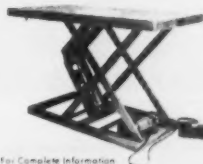


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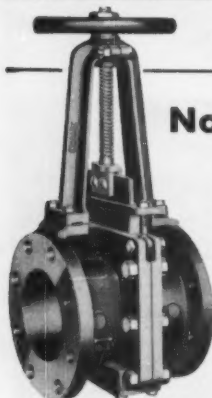
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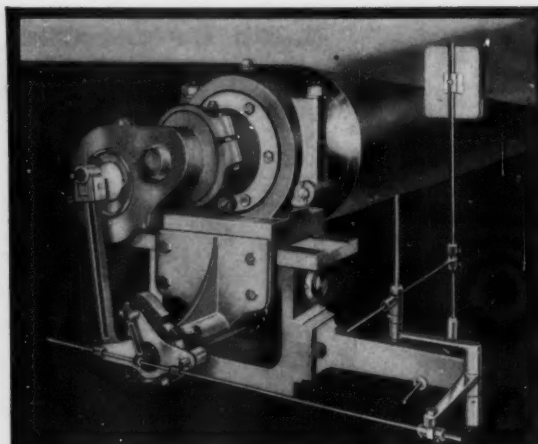
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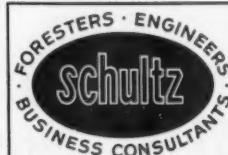
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The Population "Explosions"

There have been two recent events we would like to note as they point up sharply the very bright outlook for this industry in which you work and serve.

President John G. Strange of the Institute of Paper Chemistry, just a few weeks ago, said predictions of future world populations are being revised upward. Some persons now predict the world's population will be doubled by 2,000 A.D. But, when we consider how far behind many nations are in ordinary uses of paper, and the prospects for discovery of new uses for paper even where there are already high consumption rates, as in America, it is obvious that a doubling of production must come long before 2,000 A.D.

Economics Minister Erhard of the German Federal Republic says Europe's paper consumption will double by 1967. In the U.S.A., Stanford Research Institute has revised upward its earlier predictions, and foresees production of 42,000,000 tons by 1965. The U.S. Forest Service, back in 1955, predicted 51,000,000 tons by 1975. Production last year was 30,797,000.

If the whole world increases paper consumption by an average of only one pound per person, this would call for 1,900,000 more tons for the present population.

Dr. Strange did not discuss these possibilities, because his theme was the future of science and research. What he did point out was that the population "explosions" are a challenge to science and technology to provide future requirements of raw materials, space and energy.

It is probable that paper will continue to lose some markets to other raw materials, such as aluminum and plastics. But, on the other hand, it may take away markets from others, too. To what extent these shifts take place will depend on many key people in paper and in competitive industries—from research to sales.

Growth of Paper Industry in U.S.A.

The second event we would like to discuss, in this connection, is a new little one sheet pocket folder put out by the American Paper and Pulp Association, entitled "Pulp and Paper, an Essential Industry in the United States."

The back page points out that annual sales of paper and allied products have almost doubled in the past decade—from \$5,800,000,000 in 1948 to \$10,500,000,000 in 1958.

It lists these other facts, not new to many readers who keep up with statistics of this sort, but worth repeating, for they show the importance of this basic industry:

Total number of pulp and paper plant locations in the United States	864
States containing pulp and paper mills	42
Cities and towns with pulp and paper mills	532
Number of employees in paper and allied products industry (paper and pulp mills plus manufacturers of bags, boxes, etc.)	550,000
Wages and salaries paid annually in paper and allied products industry	\$2,500,000,000
Federal taxes paid annually—paper and allied products	\$600,000,000
State and local taxes paid annually—paper and allied products	\$200,000,000
Capital expenditures for new products and equipment in the post-war decade—paper and allied products	Over \$5,000,000,000

Paper and paperboard produced annually
Wood pulp produced annually
Annual freight bill paid by the industry
Annual payments for pulpwood
Annual expenditures for research

Over 30,000,000 tons
Over 21,000,000 tons
Over \$1,000,000,000
\$700,000,000
\$40,000,000

Paper is Money \$ \$ \$ \$ \$

Written in Ogden Nash style
by Fran Schiller, Gen. Finishing Supt.
West Virginia Pulp and Paper Co., Luke, Md.

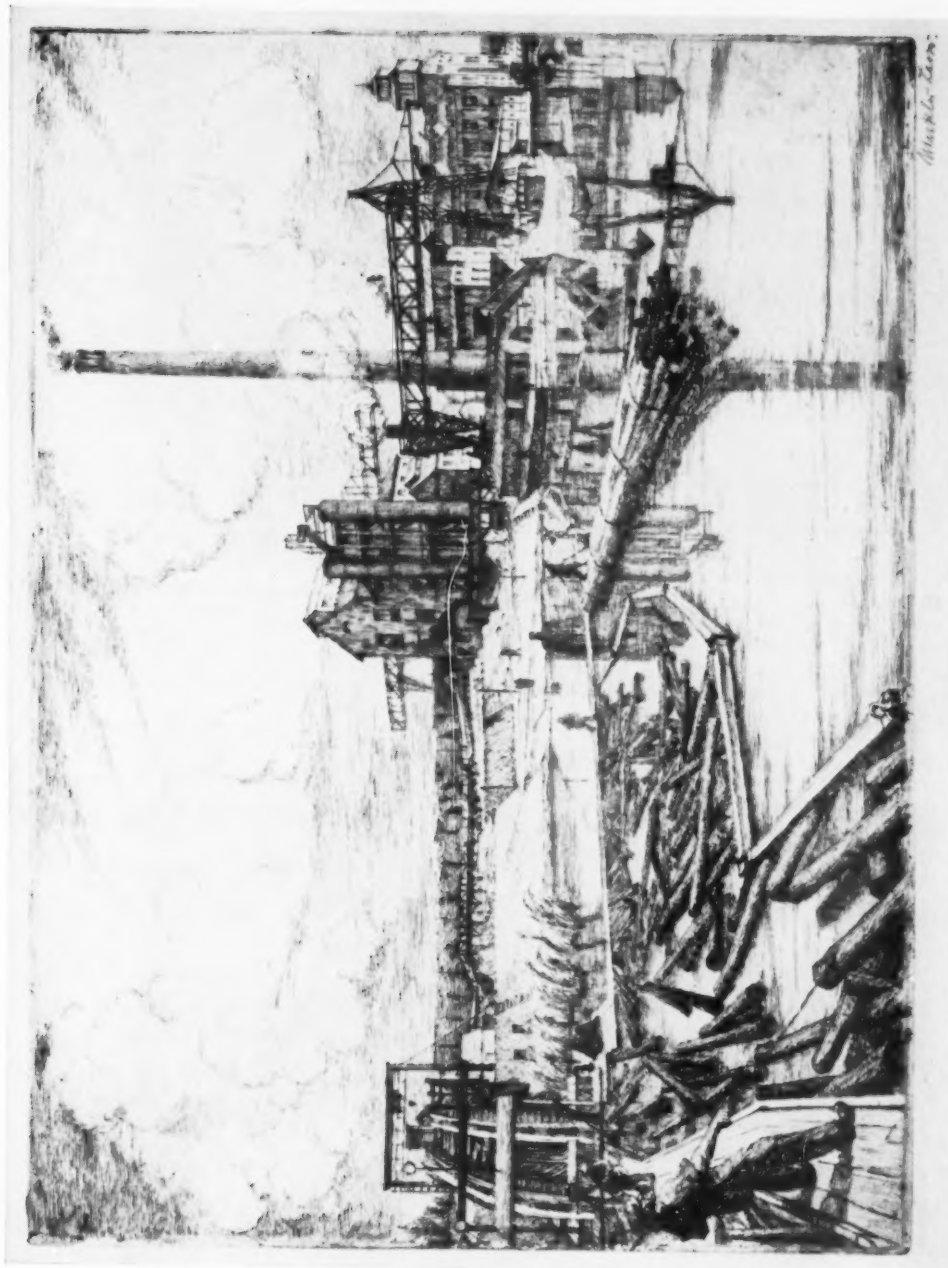
We all know, evidently, that paper is money.
At least we do when we have a twenty-dollar bill in each hand.
And when we hike up to the paymaster on payday to get a paper-check. My Gosh! We think that is simply grand. But, for some mysterious reason, we seldom act as though we know that paper in a paper mill is money.
We act as though we do not understand.

If we did, we wouldn't be running trucks into rolls of paper and damaging the edges.
And we wouldn't be moving skids around and be using them as sledges.
And when we worked on the Cutters, we wouldn't throw paper into the aisles,
And when greasy trucks and dirty shoes trampled over it, we wouldn't be all smailes.
And if we were welders working in the Finishing Room Basement, we wouldn't grab expensive cartons
To build a barricade around a torch and use the cartons to shoot sparkson.
And if we were slabbing off paper to make a splice on a rewinder,
We ought to realize that paper is worth 12 cents a pound—it would be a good reminder.
And when felt strings on a paper machine come loose in the dryer section,
We ought to trim them off and make repairs before they cause a heavy rejection.

I think they should give a medal to the guy who invented the word "broke."
Because it is quite evident he knew whereof he spoke.
The word "broke" means "paper that is wasted."
And all of the history books and all of the records show that any mill
That had an unreasonable amount of broke—never lasted.

Game and Forests—Twin Crops

"The value of natural resources lies in people making wise use of such wealth. Therefore, wise management of timber and of game is directed at the production and harvest of each as a crop—indeed, they are twin crops." So states Arthur H. Carhart, renowned sportswriter, in his new booklet "Trees and Game—Twin Crops" which is being widely distributed by American Forest Products Industries, Inc.



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